IEI Technology Corp.

MODEL:

KINO-9453

Mini-ITX SBC with Intel® Core™2 Duo Processor VGA/DVI, Dual GbE, USB 2.0, SATA, PCI and Audio RoHS Compliant

User Manual

Rev. 2.00 July 2008

RoHS Lead Free

Revision

Date	Version	Changes
2008-07	v2.00	-Changed Northbridge chipset from Intel® 945GM to Intel® 945GME -Added system fan connector (SYS_FAN1) information -Added three jumper information: • AT/ATX power mode select jumpers • LVDS screen resolution select jumper • COM3 mode select jumpers • RS-422/485 terminal resister jumpers
2007-04	v1.00	Initial Release

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Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the KINO-9453 or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the KINO-9453. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the KINO-9453. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the KINO-9453. Please take note messages seriously.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the KINO-9453 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the KINO-9453 package.

- 1 x KINO-9453 single board computer
- 1 x IDE cable
- 1 x SATA power cable
- 2 x SATA cables
- 1 x Dual RS-232 cable
- 1 x I/O shielding
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

Images of the above items are shown in **Chapter 3**.

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Chapter

1

Introduction

1.1 Introduction

Figure 1-1: KINO-9453 Embedded SBC

The KINO-9453 Mini-ITX form factor motherboard is an Intel® dual-core CPU platform. Intel® Core™2 Duo, Core Duo and Core Solo CPU are all supported to enhance the system processing speed. The KINO-9452 has a maximum front side bus (FSB) frequency of 667 MHz and contains two DDR2 SDRAM DIMM sockets that support up to 4 GB system memory.

The KINO-9453 supports diverse displays including one VGA display, one DVI display and one LVDS display. These multimedia features make the KINO-9453 a best choice for integrating into point-of-sale (POS), kiosk or digital signage applications.

The KINO-9453 supports up to two serial ATA (SATA) hard disk drives (HDD) with maximum transfer rates of 1.5 Gb/s and up to eight USB 2.0 devices. The dual PCI Express (PCIe) Gigabit Ethernet (GbE) controllers provide GbE connectivity for network communication. The KINO-9453 also has a PCI socket and a Mini PCI socket for system expansion. Three RS-232, one RS-232/422/485 and one digital input/output (DIO) port offer system integrators more choices of peripheral devices for the targeted application.

1.1.1 KINO-9453 Benefits

Some of the KINO-9453 benefits are listed below:

- Multiple display output options
- Storage flexibility with support for SATA drives and IDE drives
- Expandable system with PCI and mini PCI slots
- DDR2 support enables faster data transfers
- Multiple I/O interfaces provide connectivity to a broad range of external peripheral devices

1.1.2 KINO-9453 Features

Some of the KINO-9453 features are listed below.

- Support for Socket 479 Intel® Core 2 Duo or Core Solo CPUs
- Maximum FSB of 667 MHz
- Supports two 240-pin 400 MHz, 533 MHz or 667 MHz 2GB DDR2 DIMM memory modules
- Two SATA drives with transfer rates of 1.5 Gb/s supported
- Two Ultra ATA 100, Ultra ATA 66 or Ultra ATA 33 IDE HDDs supported
- Eight USB 2.0 devices supported
- Dual PCIe GbE Ethernet connectivity
- Multiple display options including CRT, DVI and dual-channel LVDS
- Mini-ITX form factor
- RoHS compliant
- Supports AT and ATX power supplies

1.2 KINO-9453 Overview

1.2.1 KINO-9453 Overview Photo

The KINO-9453 has a wide variety of internal and external peripheral connectors. The peripheral connectors are connected to devices including PCI devices, mini PCI devices, storage devices, display devices and serial communications devices. A labeled photo of the peripheral connectors on the front of the KINO-9453 is shown in **Figure 1-2**.

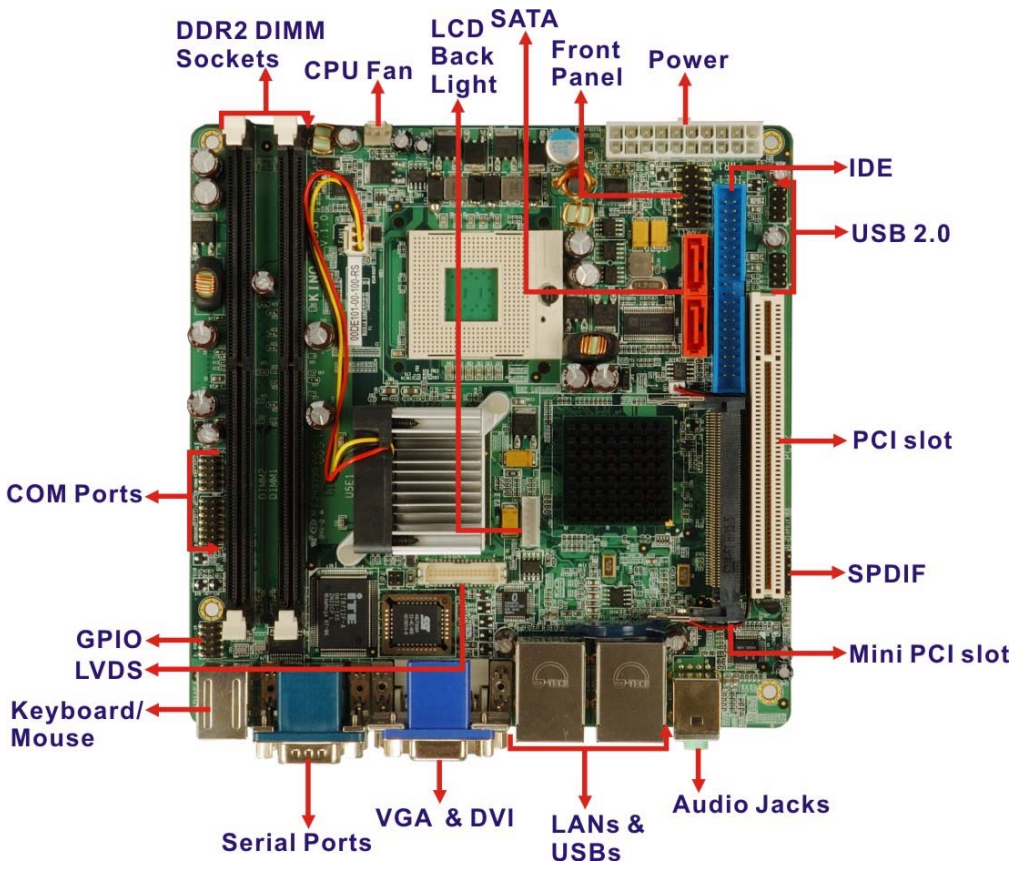


Figure 1-2: KINO-9453 Overview

1.2.2 KINO-9453 Peripheral Connectors and Jumpers

The KINO-9453 has the following connectors on-board:

- 2 x DDR2 DIMM sockets
- 1 x Digital I/O connector
- 3 x Fan connectors
- 1 x Front panel connector
- 1 x IDE Interface connector
- 1 x LCD backlight connector
- 1 x LVDS LCD connector
- 1 x Mini PCI slot
- 1 x PCI slot
- 1 x Power connector

- 2 x Serial port connectors
- 2 x SATA connectors
- 1 x SPDIF connector
- 2 x USB connectors

The KINO-9453 has the following external peripheral interface connectors on the board rear panel

- 2 x Audio jacks
- 1 x VGA connector
- 2 x Ethernet connectors
- 2 x Keyboard/Mouse connectors
- 2 x Serial port connectors
- 1 x DVI connector
- 4 x USB 2.0 ports

The KINO-9453 has the following on-board jumpers:

- AT/ATX power mode selection
- Clear CMOS
- COM3 mode selection (RS-232/422/485)
- RS-422 or RS-485 termination resister
- LVDS LCD voltage selection
- LVDS screen resolution selection

1.2.3 Technical Specifications

KINO-9453 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	KINO-9453
Form Factor	Mini-ITX
System CPU	Socket 479 Intel® Core™ 2 Duo Mobile Socket 479 Intel® Core™ Duo Socket 479 Intel® Core™ Solo

Specification	KINO-9453
	Socket 479 Intel® Celeron® M FSB 533 MHz (socket M)
Front Side Bus	533 MHz or 667 MHz
System Chipset	**Northbridge**: Intel® 945GME **Southbridge**: Intel® ICH7-M
Memory	Two 240-pin 400 MHz, 533 MHz or 667 MHz DDR2 SDRAM DIMMs supported (system max. 4 GB)
Display	**CRT**: Integrated in the Intel® 945GME to support CRT **DVI**: Integrated in the Intel® 945GME by SDVO interface **LVDS**: Dual channel 18-bit or 24-bit LVDS LCD panel
BIOS	AMI BIOS
Audio	Realtek ALC655 with AC'97 codec
LAN	Two Broadcom BCM5787M PCIe GbE controllers
COM	Three RS-232 serial ports (one internal, two external) One RS-232, RS-422 or RS-485 serial port
USB2.0	Eight USB 2.0 devices supported
IDE	One 40-pin IDE connects to two Ultra ATA33/66/100 devices
SATA	Two 1.5 Gb/s SATA drives supported
Keyboard/mouse	Two PS/2 connectors support mouse and keyboard connectivity
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Supply	AT and ATX supported
Temperature	0ºC – 60ºC (32ºF - 140ºF)
Humidity (operating)	5%~95% non-condensing

Specification	KINO-9453
Dimensions (LxW)	170 mm x 170 mm
Weight (GW/NW)	900g/ 362g

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and on-board features of the KINO-9453 in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are listed below:

- **Length**: 170 mm
- **Width**: 170 mm

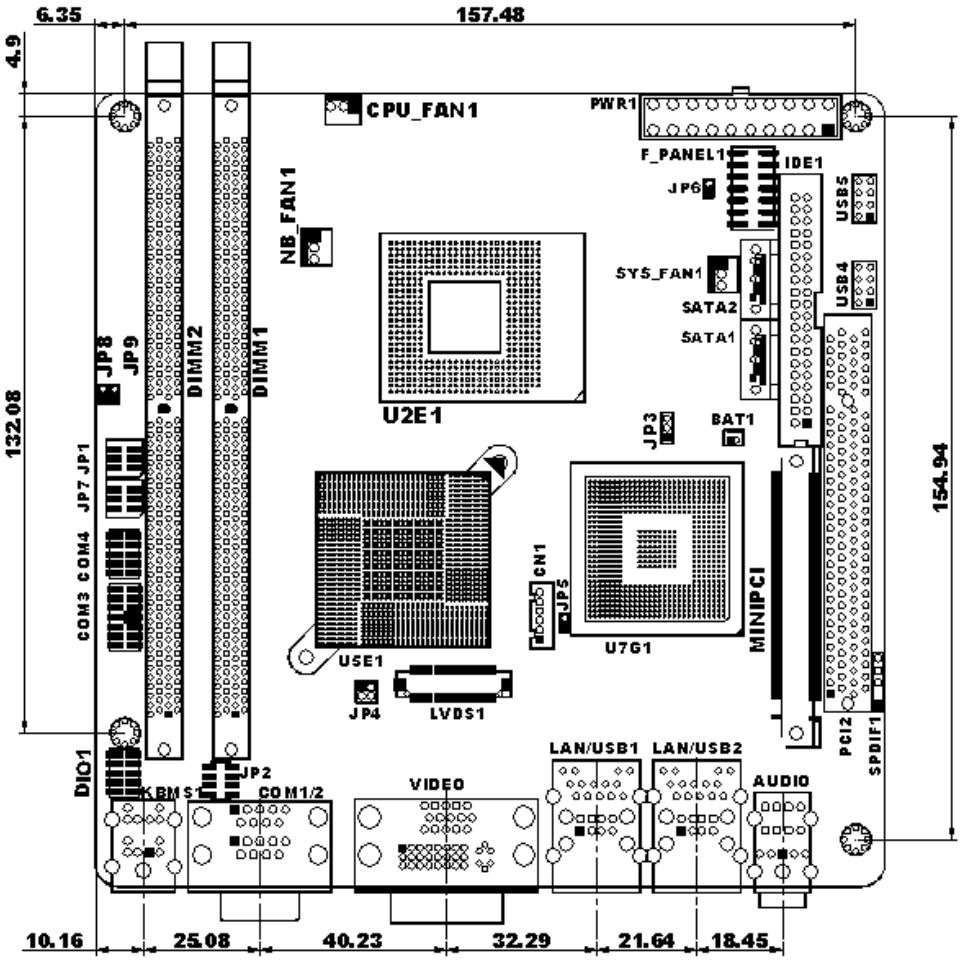


Figure 2-1: KINO-9453 Dimensions (mm)

2.2.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

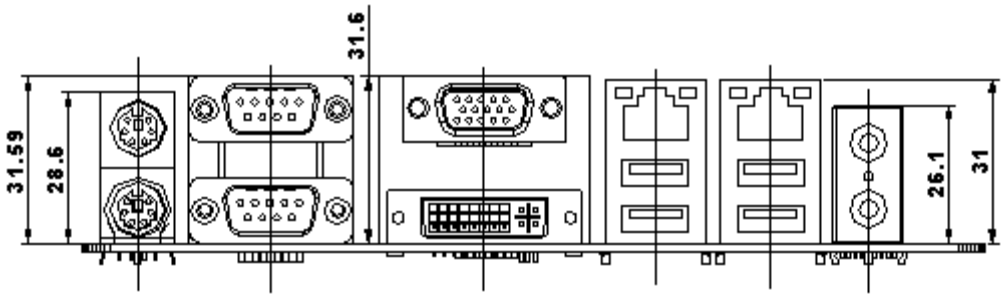


Figure 2-2: External Interface Panel Dimensions (mm)

2.3 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

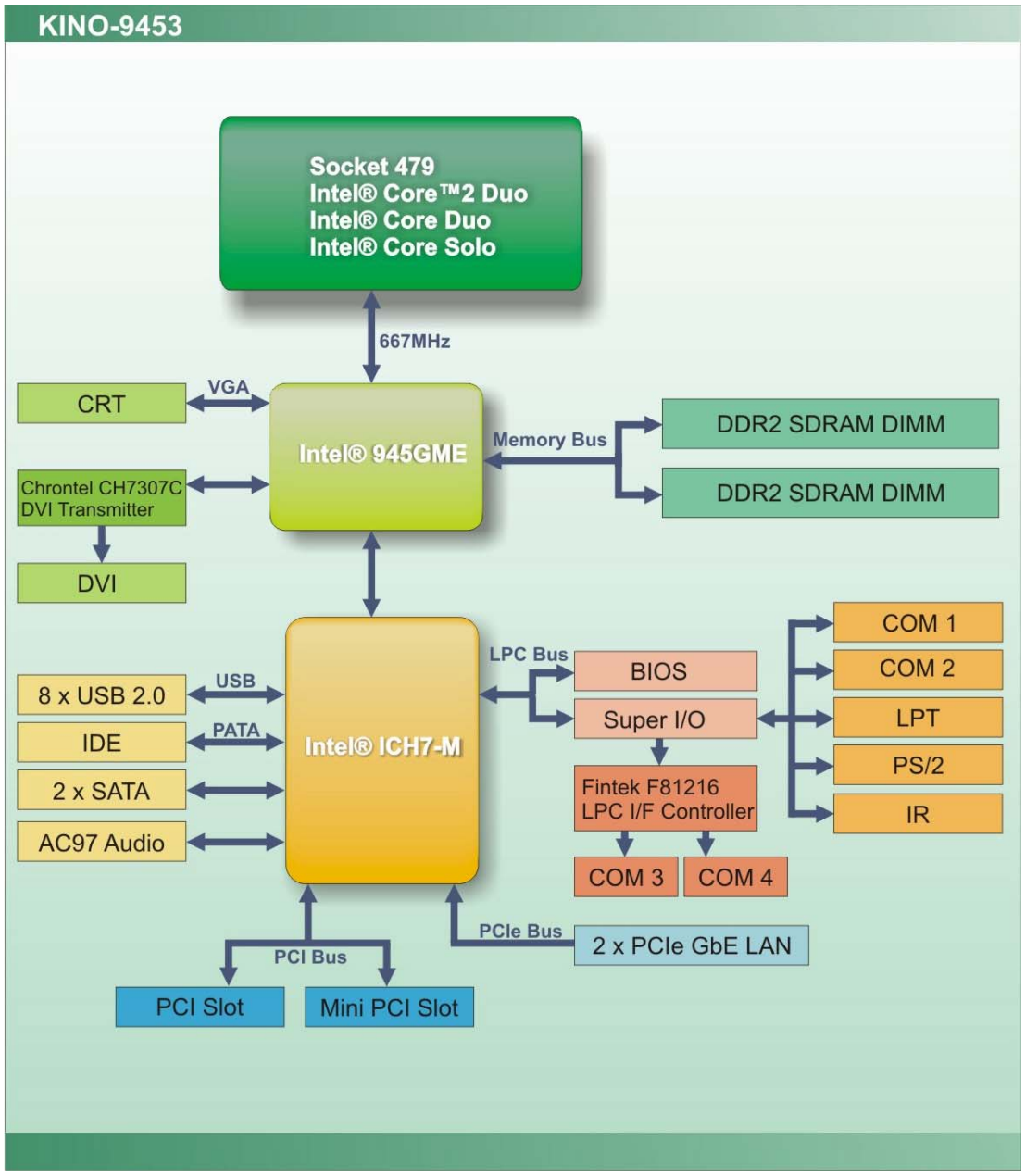


Figure 2-3: Data Flow Block Diagram

2.4 Compatible Processors

2.4.1 Compatible Processor Overview

The KINO-9453 supports the following socket 479 processors:

- Intel® Core™2 Duo Mobile processors
- Intel® Core™ Duo processors
- Intel® Core™ Solo processors
- Intel® Celeron® M processors

The first three of the above processors communicate with the Intel® 945GME GMCH through a 667 MHz FSB and the Intel® Celeron® M processor through a 533 MHz FSB. Features of the supported processors are listed in **Table 2-1**.

CPU Features	Core™2 Duo	Core™ Duo	Core™ Solo	Celeron® M
Dual core	Yes	Yes	No	No
Enhanced Halt State (C1E)	No	Yes	No	No
Enhanced Intel® Speedstep® Technolgy	Yes	Yes	Yes	No
Execute Disable Bit	Yes	Yes	Yes	Yes
Intel® EM64T	Yes	No	No	No
Intel® Virtualization Technology	Yes	Yes	No	No

Table 2-1: Processor Features

2.4.2 Supported Processors

Specifications for the compatible processors are listed in **Table 2-2** below:

Family	sSpec#	CPU Speed	Processor #	Bus Speed	Mfg Tech	Stepping	Cache Size
Core™2 Duo Mobile	SL9SJ	2.33 GHz	T7600	667 MHz	65 nm	B2	4 MB
	SL9SK	2.16 GHz	T7400	667 MHz	65 nm	B2	4 MB
	SL9SL	2 GHz	T7200	667 MHz	65 nm	B2	4 MB
	SL9SP	1.83 GHz	T5600	667 MHz	65 nm	B2	2 MB

Family	sSpec#	CPU Speed	Processor #	Bus Speed	Mfg Tech	Stepping	Cache Size
	SL9SQ	1.66 GHz	T5500	667 MHz	65 nm	B2	2 MB
Core™ Duo	SL8VT	2 GHz	T2500	667 MHz	65 nm	C0	2 MB
	SL9DN	1.66 GHz	T2300E	667 MHz	65 nm	C0	2 MB
Core™ Solo	SL92X	1.83 GHz	T1400	667 MHz	65 nm	C0	2 MB
Celeron® M	SL9VA	1.73 GHz	530	533 MHz	65 nm	A1	1 MB
	SL9LF	1.86 GHz	440	533 MHz	65 nm	D0	1 MB

Table 2-2: Supported Processors

2.5 Intel® 945GME Northbridge Chipset

2.5.1 Intel® 945GME Overview

The Intel® 945GME Northbridge chipset has the Generation 3.1 Intel Integrated Graphics Engine and the Intel® Graphics Media Accelerator 950 (Intel® GMA 950). The integrated graphics and memory controller hub (GMCH) facilitates the flow of information primarily between the following four interfaces:

- Front Side Bus (FSB)
- System Memory Interface
- Graphics Interface
- Direct Media Interface (DMI)

2.5.2 Intel® 945GME Memory Support

WARNING:

Only DDR2 memory module can be installed on the KINO-9453. Do not install DDR memory modules. If a DDR memory module is installed on the KINO-9453, the KINO-9453 may be irreparably damaged.

The Intel® 945GME Northbridge chipset on the KINO-9453 supports two DDR2 240-pin DIMMs with the following features:

- Two 240-pin DIMMs
- DDR2 only (**DO NOT** install a DDR DIMM)
- Single-channel or dual-channel
- Capacities of 256 MB, 512 MB, 1 GB or 2 GB
- Transfer speeds of 400 MHz, 533 MHz, or 667 MHz

The memory sockets are shown in **Figure 2-4**.

Figure 2-4: 240-pin DIMM Sockets

2.5.3 Intel® 945GME Integrated Graphics

The Intel® 945GME Northbridge chipset has an Intel® Gen. 3.5 integrated graphics engine that supports the following display devices:

- Analog CRT
- LVDS
- S-DVO interface (DVI connector)

2.5.3.1 Intel® 945GME Analog CRT Support

A DB-15 VGA connector on the external peripheral interface connector panel is interfaced to the Intel® 945GME graphics engine. The Intel® 945GME internal graphics engine, with an integrated 400 MHz RAMDAC and hot plug CRT support, supports analog CRT monitors up to QXGA.

2.5.3.2 Intel® 945GME LVDS Support

A 30-pin LVDS crimp connector is interfaced to the Intel® 945GME graphics engine. The Intel® 945GME internal graphics engine supports LVDS displays with the following features:

- Up to UXGA monitors with a maximum resolution of 1600 x 1200
- 18-bit or 24-bit 25 MHz to 112 MHz single-channel or dual-channel LVDS screens
- CPIS 1.5 compliant LVDS screens

2.5.3.3 Intel® 945GME SDVO Support

The Intel® 945GME internal graphics engine has the following SDVO output features:

- Concurrent operation of PCIe x1 with SDVO
- Two SDVO ports supported
  - SDVO is muxed onto the PCIe pins
  - DVI 1.0 support for external digital monitor
  - Only Downstream HDCP support
  - Display hot plug support

2.5.4 Intel® 945GME Direct Media Interface (DMI)

Intel® 945GME Northbridge GMCH is connected to the Intel® ICH7-M Southbridge Chipset through the chip-to-chip Direct Media Interface (DMI). Features of the Intel® 945GME DMI are listed below:

- 2 GB/s (1 GB/s in each direction) bus speed
- 32-bit downstream address

2.6 Intel® ICH7-M Southbridge Chipset

2.6.1 Intel® ICH7-M Overview

The Intel® ICH7-M Southbridge chipset is connected to the Intel® 945GME Northbridge GMCH through the chip-to-chip Direct Media Interface (DMI). Some of the features of the Intel® ICH7-M are listed below.

- Complies with PCI Express Base Specification, Revision 1.0a
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller
  - Interrupt controller
  - Timer functions
- Integrated SATA host controller with DMA operations interfaced to two SATA connectors on the KINO-9453
- Integrated IDE controller supports Ultra ATA 100/66/33
- Supports the six USB 2.0 devices on the KINO-9453 with four UHCI controllers and one EHCI controller
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Audio Codec ’97 (AC’97) Revision 2.3
- Supports Intel® High Definition Audio
- Contains Low Pin Count (LPC) interface
- Supports Firmware Hub (FWH) interface

2.6.2 Intel® ICH7-M Audio Codec ’97 Controller

The KINO-9453 has an integrated Realtek ALC655 codec. The ALC655 codec is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio codec designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs. Complete surround sound requires six-channel audio consisting of:

- Front left

- Front right
- Back left
- Back right
- Center
- Subwoofer

2.6.3 Intel® ICH7-M IDE Interface

The integrated IDE interface on the ICH7-M Southbridge supports two IDE hard disks and ATAPI devices. PIO IDE transfers up to 16 MB/s and Ultra ATA transfers of 100 MB/s. The integrated IDE interface is able to support the following IDE HDDs:

- **Ultra ATA/100**, with data transfer rates up to 100 MB/s
- **Ultra ATA/66**, with data transfer rates up to 66 MB/s
- **Ultra ATA/33**, with data transfer rates up to 33 MB/s

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/100
IDE devices	2	2	2
PIO Mode	0 – 4	0 – 4	0 – 4
PIO Max Transfer Rate	16.6 MB/s	16.6 MB/s	16.6 MB/s
DMA/UDMA designation	UDMA 3 - 4	UDMA 3 – 4	UDMA 2
DMA/UDMA Max Transfer	100 MB/s	66 MB/s	33 MB/s
Controller Interface	5V	5V	5V

Table 2-3: Supported HDD Specifications

2.6.4 Intel® ICH7-M Low Pin Count (LPC) Interface

The ICH7-M LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH7-M is connected to the following components:

- BIOS chipset
- Super I/O chipset

2.6.5 Intel® ICH7-M PCI Interface

The PCI interface on the ICH7-M is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33 MHz
- 5 V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

2.6.6 Intel® ICH7-M Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH7-M. The RTC operates on a 3V battery and 32.768 KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.6.7 Intel® ICH7-M SATA Controller

The integrated SATA controller on the ICH7-M Southbridge supports two SATA drives on the KINO-9453 with independent DMA operations. SATA controller specifications are listed below.

- Supports two SATA drives
- Supports 1.5 Gb/s data transfer speeds
- Supports Serial ATA Specification, Revision 1.0a

2.6.8 Intel® ICH7-M USB Controller

Up to eight high-speed, full-speed or low-speed USB devices are supported by the ICH7-M on the KINO-9453. High-speed USB 2.0, with data transfers of up to 480 MB/s, is enabled with the ICH7-M integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the ICH7-M integrated Universal Host Controller Interface (UHCI) controllers.

2.7 PCIe Bus Components

2.7.1 PCIe Bus Overview

The PCIe bus is connected to components listed below:

- Two PCIe GbE Broadcom LAN controllers

2.7.2 Broadcom PCI Express GbE interface

The Broadcom BCM5787M PCI Express (PCIe) GbE controller is a 10/100/1000BASE-T Ethernet LAN controller. The BCM5787M combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, a PCIe bus interface, and an on-chip buffer memory. Some of the BCM5787 controller features are listed below:

- Integrated 10/100/1000BASE-T transceiver
- Automatic MDI crossover function
- PCIe v1.0a
- 10/100/1000BASE-T full/half-duplex MAC
- Wake on LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash support
- JTAG support

2.8 LPC Bus Components

2.8.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset

2.8.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

2.8.3 Super I/O chipset

The iTE IT8712F Super I/O chipset is connected to the ICH7-M Southbridge through the LPC bus. The iTE IT8712F is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the iTE IT8712F chipset are listed below:

- LPC Interface
- PC98/99/2001, ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- SmartGuardian Controller
- Single +5V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Floppy Disk Controller
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5V Power Supply

Some of the Super I/O features are described in more detail below:

2.8.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.8.3.2 Super I/O 16C550 UARTs

The on-board Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports (COM1 and COM2)
- IrDa 1.0 and ASKIR protocols

Another two chipsets connected to the LPC bus provided connectivity to another two serial port connectors (COM3 and COM4).

2.8.3.3 Super I/O Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.8.3.4 Super I/O Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.8.3.5 Super I/O Keyboard Controller

The Super I/O keyboard controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

2.9 Environmental and Power Specifications

2.9.1 System Monitoring

Three thermal inputs on the KINO-9453 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- System temperature
- Power temperature
- CPU temperature

Eight voltage inputs on the KINO-9453 Super I/O Enhanced Hardware Monitor monitor the following voltages:

- CPU Core
- +2.5V
- +3.30V
- +5.00V
- +12.0V
- GMCH (1.5V)
- 1.05V
- 5VSB
- VBAT

The KINO-9453 Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

- VBAT

The KINO-9453 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.9.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the KINO-9453 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the Northbridge and Southbridge chipsets to ensure the operating temperature of these chips remain low.

2.9.3 Power Consumption

Table 2-4 shows the power consumption parameters for the KINO-9453 running with a 2.33 GHz Intel® Core™2 Duo T7600 processor with 2 GB of DDR2 memory.

Voltage	Current
+5V	4.1A
+12V	2.23A
5VSB	0.58A

Table 2-4: Power Consumption

Table 2-4 shows the power consumption parameters for the KINO-9453 running with a 2.33 GHz Intel® Core™ Duo T2700 processor with 2 GB of DDR2 memory.

Voltage	Current
+5V	4.16A
+12V	1.96A
5VSB	0.59A

Table 2-5: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the KINO-9453 may result in permanent damage to the KINO-9453 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-9453. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-9453, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the KINO-9453, place it on an antic-static pad. This reduces the possibility of ESD damaging the KINO-9453.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the KINO-9453 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the KINO-9453 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the KINO-9453 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

The KINO-9453 is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-9453	
1	Dual RS-232 Cable (**P/N**:32200-028401-RS)	
1	IDE cable (**P/N**: 32200-008800-RS)	
2	SATA cables (**P/N**: 32000-0628000-RS)	

1	SATA power cable (**P/N**: 32100-088600-RS)	
1	Mini jumper Pack	
1	Quick installation guide	
1	Utility CD	
1	I/O shielding	

Table 3-1: Package List Contents

3.3.2 Optional Items

NOTE:

The items listed in this section are optional items that must be ordered separately. Please contact your KINO-9453 vendor, distributor or reseller for more information or, contact IEI directly by sending an email to sales@iei.com.tw.

The following optional items are available for the KINO-9453.

Quantity	Item and Part Number	Image
1	Dual port USB cable (**P/N**: CB-USB02-RS)	
1	Four port USB cable (**P/N**: CB-USB14-RS)	
1	RS-232/422/485 cable (**P/N**: 32200-000077-RS)	
1	CPU Cooler (**P/N**: CF-479B-RS)	

Table 3-2: Optional Items

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.1 shows peripheral interface connector locations. **Section 4.1.2** lists all the peripheral interface connectors seen in **Section 4.1.3**.

4.1.1 KINO-9453 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

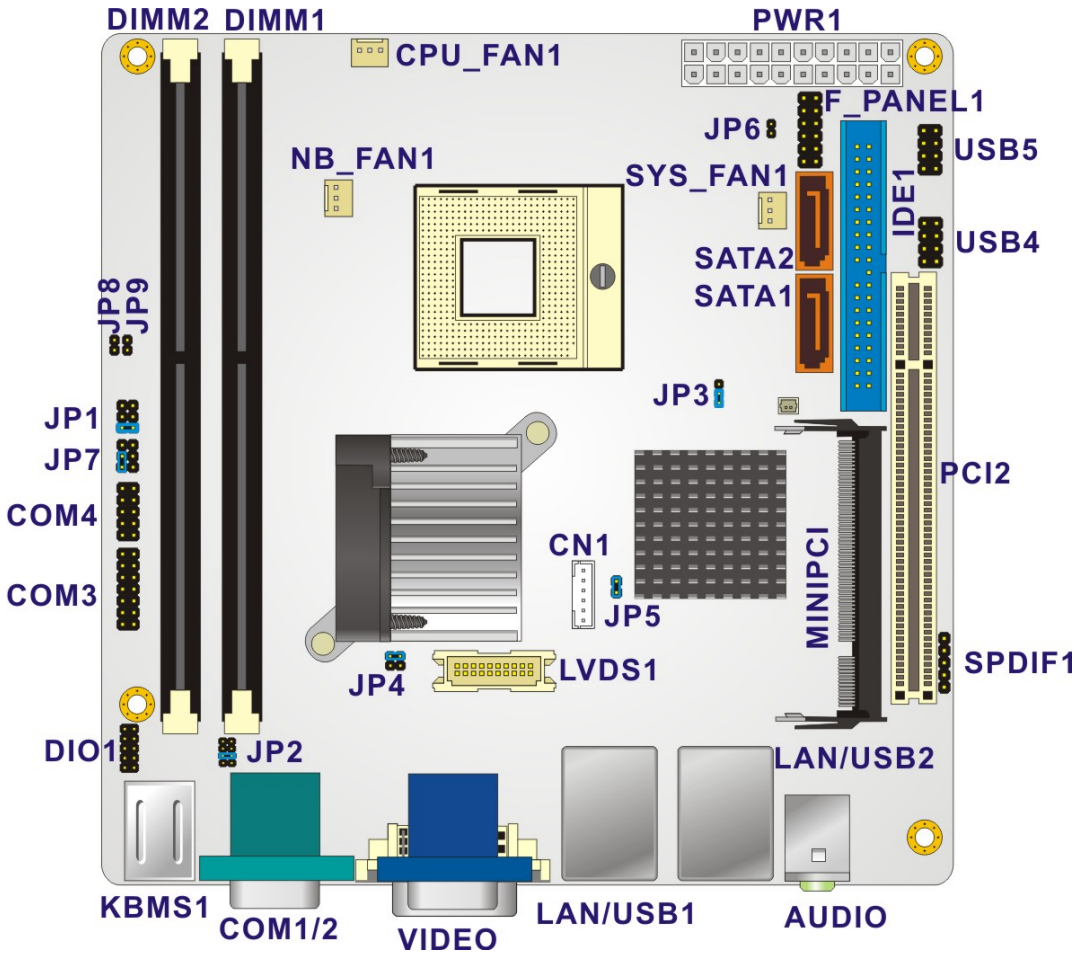


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the KINO-9453. Detailed descriptions of these connectors can be found in **Section 4.2**.

Connector	Type	Label
ATX power supply connector	20-pin ATX connector	PWR1
Digital I/O connector	10-pin header	DIO1
Fan connector (CPU)	3-pin wafer	CPU_FAN1
Fan connector (Northbridge)	3-pin wafer	NB_FAN1
Fan connector (System)	3-pin wafer	SYS_FAN1
Front panel connector	14-pin header	F_PANEL1
IDE Interface connector	40-pin box header	IDE1
LVDS connector	30-pin crimp	LVDS1
LCD backlight connector	6-pin wafer connector	CN1
PCI slot	124-pin slot	PCI2
Mini PCI Card slot	124-pin slot	MINIPCI
Serial ATA (SATA) connector	7-pin SATA connector	SATA1
Serial ATA (SATA) connector	7-pin SATA connector	SATA2
Serial port connector (COM 3)	14-pin header	COM3
Serial port connector (COM 4)	10-pin header	COM4
SPDIF connector	5-pin header	SPDIF1
USB connector	8-pin header	USB4
USB connector	8-pin header	USB5

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the KINO-9453. Detailed descriptions of these connectors can be found in **Section 4.3**.

Connector	Type	Label
Audio connector	Audio jack	AUDIO
Ethernet connector	RJ-45	LAN/USB1
Ethernet connector	RJ-45	LAN/USB2
Keyboard and mouse connector	PS/2 connector	KBMS1
RS-232 serial port connector	Male DB-9	COM1
RS-232 serial port connector	Male DB-9	COM2
USB ports	USB port	LAN/USB1
USB ports	USB port	LAN/USB2
VGA port connector	Female DB-15	VIDEO
DVI connector	DVI connector	VIDEO

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the KINO-9453.

4.2.1 Fan Connectors

CN Label: **CPU_FAN1**, **NB_FAN1** and **SYS_FAN1**

CN Type: 3-pin header

CN Location: See **Figure 4-2**

CN Pinouts: See **Table 4-3**

The cooling fan connectors on the KINO-9453 provide a 12 V, 500 mA current to one CPU cooling fan, one Northbridge cooling fan and one system cooling fan. There is a “sense” pin in the fan connector, which transfers the fan’s sense signal to the system BIOS in order to recognize the fan speed. Please note that only some specific types of fans offer a rotation signal.

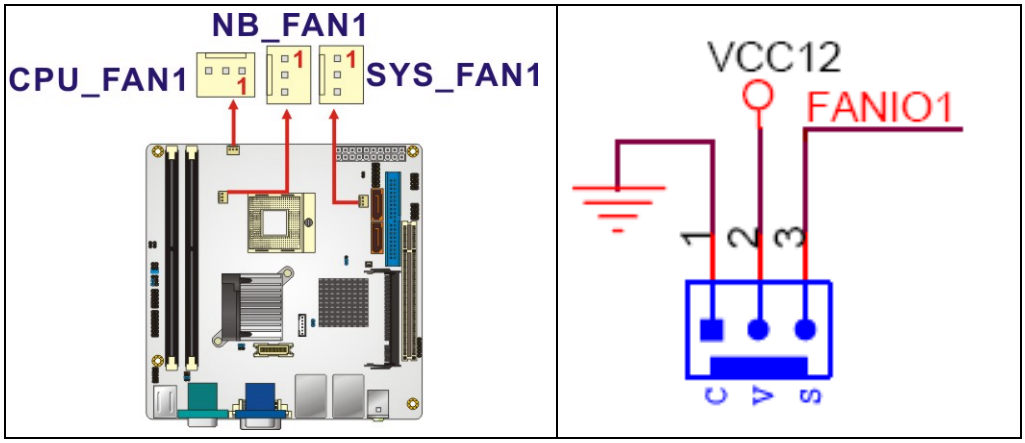


Figure 4-2: Fan Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	Sense

Table 4-3: Fan Connector Pinouts

4.2.2 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 4-3**

CN Pinouts: See **Table 4-4**

The front panel connector connects to several external switches and indicators to monitor and control the motherboard. These indicators and switches include:

- Power
- Power button
- Reset button
- Speaker
- HDD

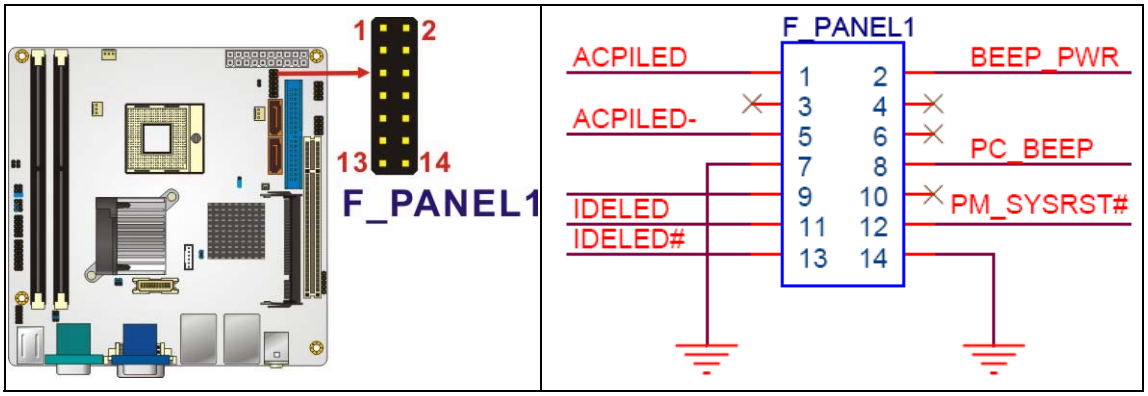


Figure 4-3: Front Panel Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Power LED+	2	Speaker+
3	NC	4	NC
5	Power LED-	6	NC
7	Power Button#	8	Speaker-
9	Power Button	10	NC
11	IDE LED+	12	Reset Button
13	IDE LED-	14	Reset Button#

Table 4-4: Front Panel Connector Pinouts

4.2.3 Digital Input/Output Connector

CN Label: **DIO1**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-4**

CN Pinouts: See **Table 4-5**

The DIO connector is managed through a Super I/O chip. The DIO connector pins are user programmable. The digital IO port of KINO-9453 is 5 V CMOS level.

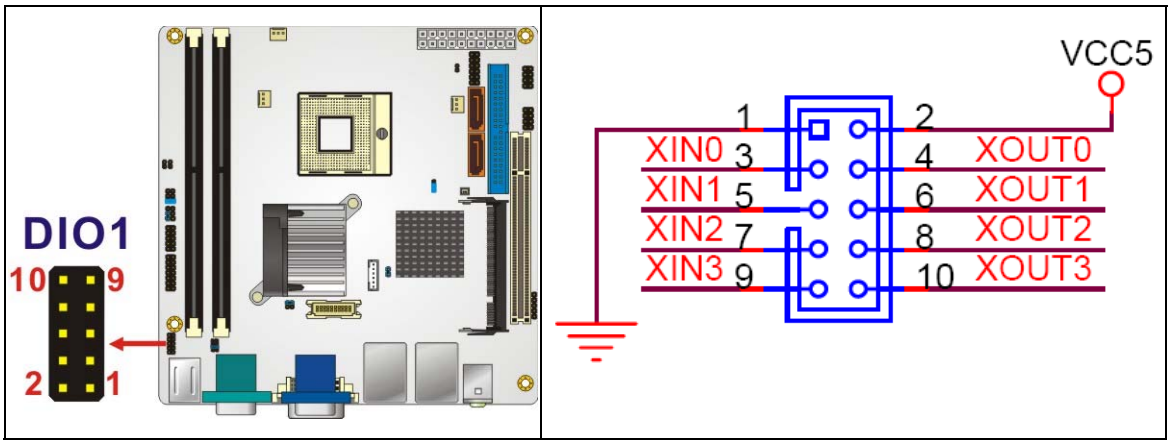


Figure 4-4: GPIO Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	INPUT0	4	OUTPUT0
5	INPUT1	6	OUTPUT1
7	INPUT2	8	OUTPUT2
9	INPUT3	10	OUTPUT3

Table 4-5: GPIO Connector Pinouts

4.2.4 IDE Connector

CN Label: **IDE1**

CN Type: 40-pin header (2x20)

CN Location: See **Figure 4-5**

CN Pinouts: See **Table 4-6**

One primary 40-pin IDE device connector on the KINO-9453 motherboard supports connectivity to ATA 100 IDE devices with data transfer rates up to 100 MB/s.

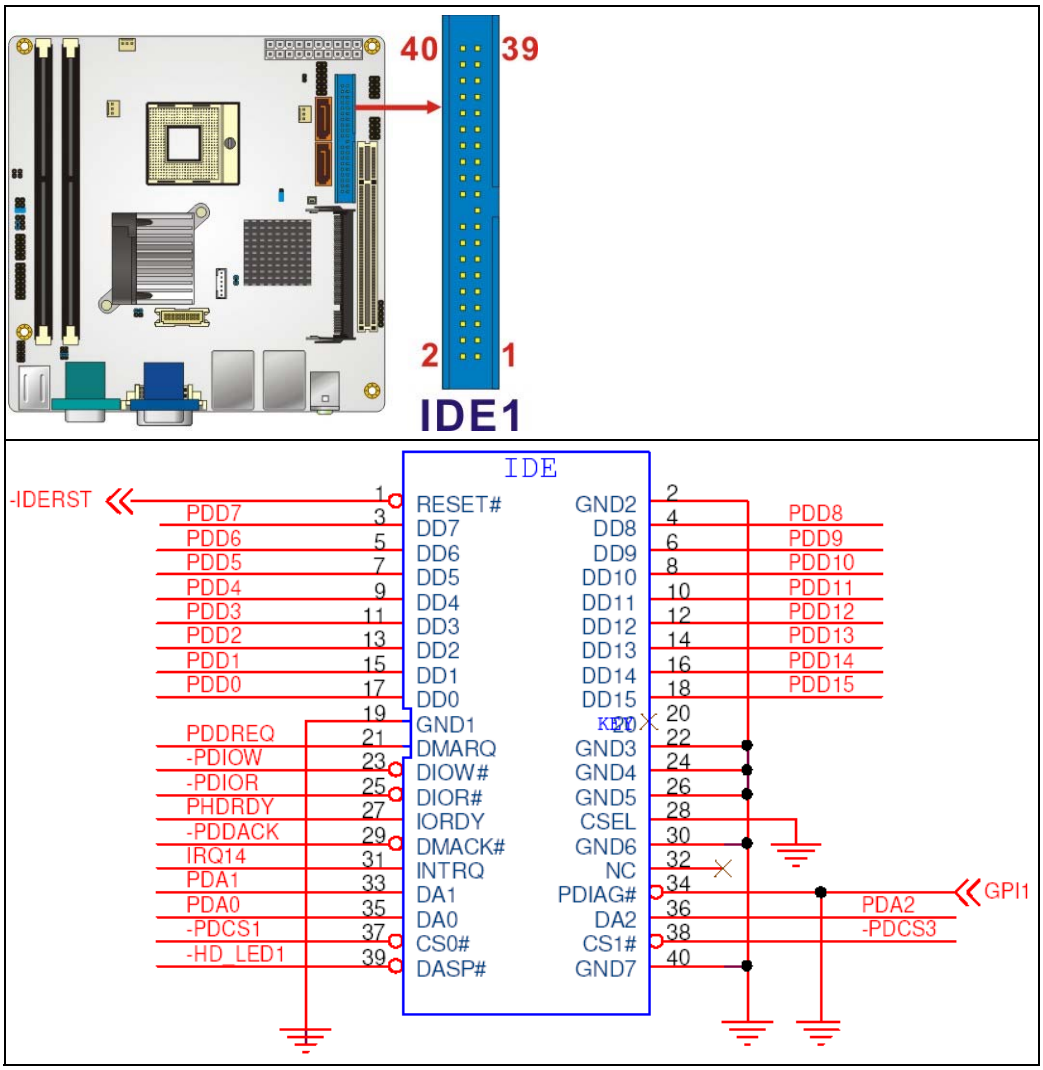


Figure 4-5: IDE Device Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	(KEY)
21	DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	CHRDY	28	GND
29	DACK	30	GND
31	INTERRUPT	32	N/C
33	SA1	34	P66DET
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND

Table 4-6: IDE Connector Pinouts

4.2.5 LCD Backlight Connector

CN Label: **CN1**

CN Type: 6-pin header (1x6)

CN Location: See **Figure 4-6**

CN Pinouts: See **Table 4-7**

The LCD backlight connector is for the LCD inverter connection.

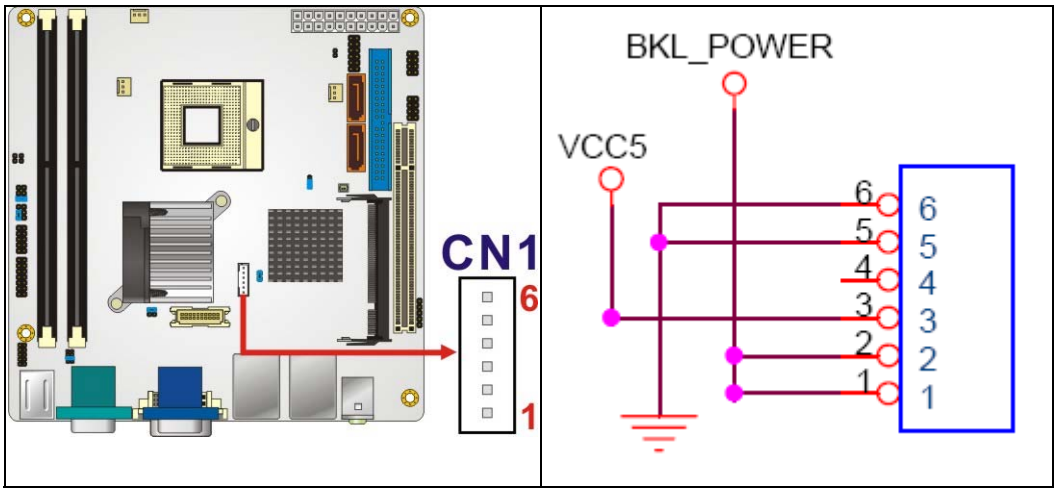


Figure 4-6: LCD Backlight Connector Location

PIN NO.	DESCRIPTION
1	Back Light Power
2	Back Light Power
3	Back Light enable
4	NC
5	GND
6	GND

Table 4-7: LCD Backlight Connector Pinouts

4.2.6 LVDS LCD connector

CN Label: **LVDS1**

CN Type: 30-pin connector (2x15)

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-8**

The connector supports one or two channel (18-bit or 24-bit) LVDS panel.

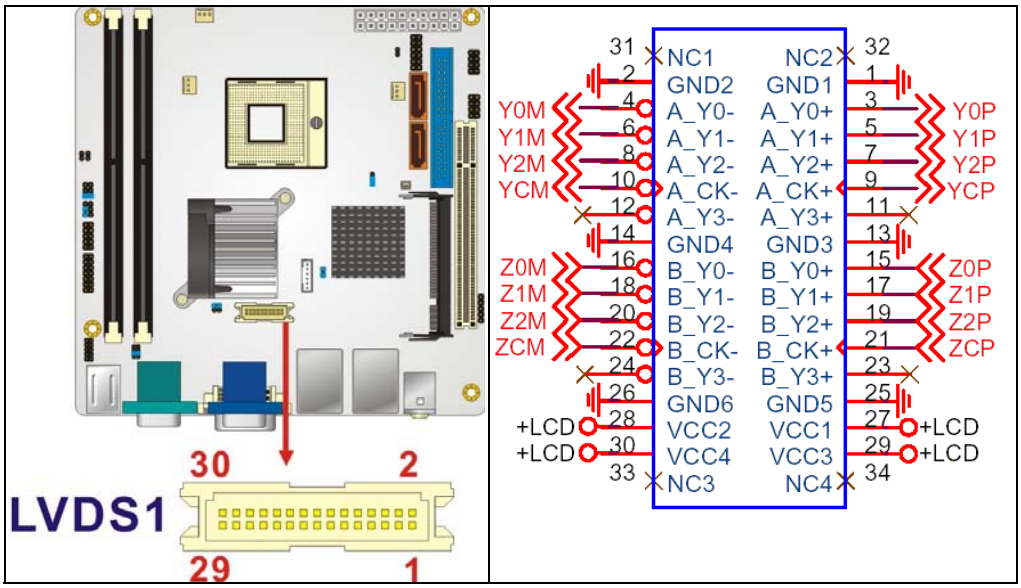


Figure 4-7: LVDS LCD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	1st LVDS data0 output +	4	1st LVDS data0 output -
5	1st LVDS data1 output +	6	1st LVDS data1 output -
7	1st LVDS data2 output +	8	1st LVDS data2 output -
9	1st LVDS clock output +	10	1st LVDS clock output -
11	NC	12	NC
13	GND	14	GND
15	2nd LVDS data0 output +	16	2nd LVDS data0 output -
17	2nd LVDS data1 output +	18	2nd LVDS data1 output -
19	2nd LVDS data2 output +	20	2nd LVDS data2 output -
21	2nd LVDS clock output +	22	2nd LVDS clock output -
23	NC	24	NC
25	GND	26	GND
27	+LCD (3.3V, 5V or 12V)	28	+LCD (3.3V, 5V or 12V)
29	+LCD (3.3V, 5V or 12V)	30	+LCD (3.3V, 5V or 12V)

Table 4-8: LVDS LCD Connector Pinouts

4.2.7 Mini PCI Slot

CN Label: **MINIPCI**

CN Type: 124-pin Mini PCI Type III slot

CN Location: See **Figure 4-8**

CN Pinouts: See **Table 4-9**

Mini PCI is a small form factor version of a PCI card. Mini PCI expansion devices can be inserted into the Mini PCI slot.

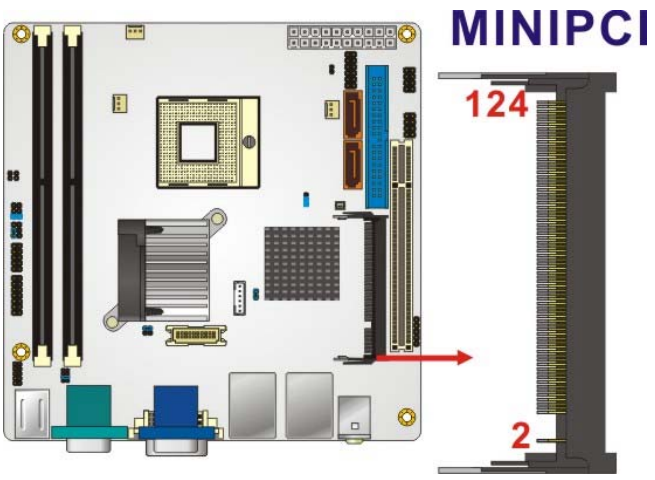


Figure 4-8: Mini PCI Slot Location

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
1	TIP	32	GROUND	63	3.3V	94	AD[02]
2	RING	33	AD[31]	64	FRAME#	95	AD[03]
3	8PMJ-3	34	PME#	65	CLKRUN#	96	AD[00]
4	8PMJ-1	35	AD[29]	66	TRDY#	97	5V
5	8PMJ-6	36	RESERVED	67	SERR#	98	RESERVED_WIP5
6	8PMJ-2	37	GROUND	68	STOP#	99	AD[01]
7	8PMJ-7	38	AD[30]	69	GROUND	100	RESERVED_WIP5
8	8PMJ-4	39	AD[27]	70	3.3V	101	GROUND
9	8PMJ-8	40	3.3V	71	PERR#	102	GROUND

10	8PMJ-5	41	AD[25]	72	DEVSEL#	103	AC_SYNC
11	LED1_GRNP	42	AD[28]	73	C/BE[1]#	104	M66EN
12	LED2_YELP	43	RESERVED	74	GROUND	105	AC_SDATA_IN
13	LED1_GRNN	44	AD[26]	75	AD[14]	106	AC_SDATA_OUT
14	LED2_YELN	45	C/BE[3]#	76	AD[15]	107	AC_BIT_CLK
15	CHSGND	46	AD[24]	77	GROUND	108	AC_CODEC_ID0#
16	RESERVED	47	AD[23]	78	AD[13]	109	AC_CODEC_ID1#
17	INTB#	48	IDSEL	79	AD[12]	110	AC_RESET#
18	5V	49	GROUND	80	AD[11]	111	MOD_AUDIO_MON
19	3.3V	50	GROUND	81	AD[10]	112	RESERVED
20	INTA#	51	AD[21]	82	GROUND	113	AUDIO_GND
21	RESERVED	52	AD[22]	83	GROUND	114	GROUND
22	RESERVED	53	AD[19]	84	AD[09]	115	SYS_AUDIO_OUT
23	GROUND	54	AD[20]	85	AD[08]	116	SYS_AUDIO_IN
24	3.3VAUX	55	GROUND	86	C/BE[0]#	117	SYS_AUDIO_OUT GND
25	CLK	56	PAR	87	AD[07]	118	SYS_AUDIO_IN GND
26	RST#	57	AD[17]	88	3.3V	119	AUDIO_GND
27	GROUND	58	AD[18]	89	3.3V	120	AUDIO_GND
28	3.3V	59	C/BE[2]#	90	AD[06]	121	RESERVED
29	REQ#	60	AD[16]	91	AD[05]	122	MPCIACT#
30	GNT#	61	IRDY#	92	AD[04]	123	VCC5VA
31	3.3V	62	Ground	93	RESERVED	124	3.3VAUX

Table 4-9: Mini PCI Slot Pinouts

4.2.8 Power Connector

CN Label: **PWR1**

CN Type: 20-pin connector

CN Location: See **Figure 4-9**

CN Pinouts: See **Table 4-10**

This 20-pin power connector supports the ATX power supply.

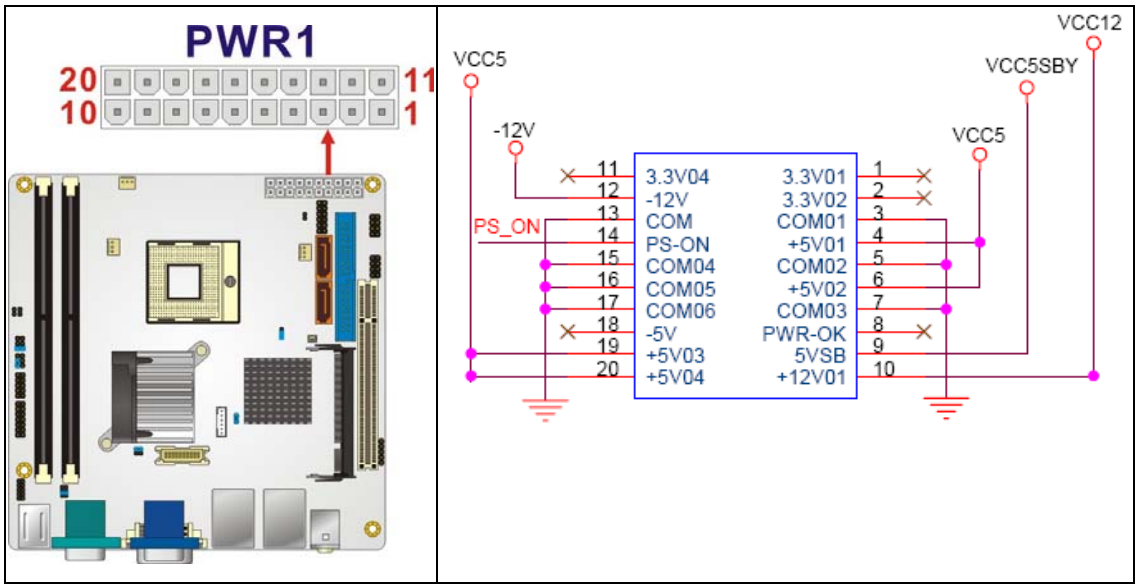


Figure 4-9: Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power good	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

Table 4-10: Power Connector Pinouts

4.2.9 14-Pin Serial Port Connectors

CN Label: **COM3**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 4-10**

CN Pinouts: See **Table 4-11**

The serial ports connectors connect to RS-232/422/485 serial port device.

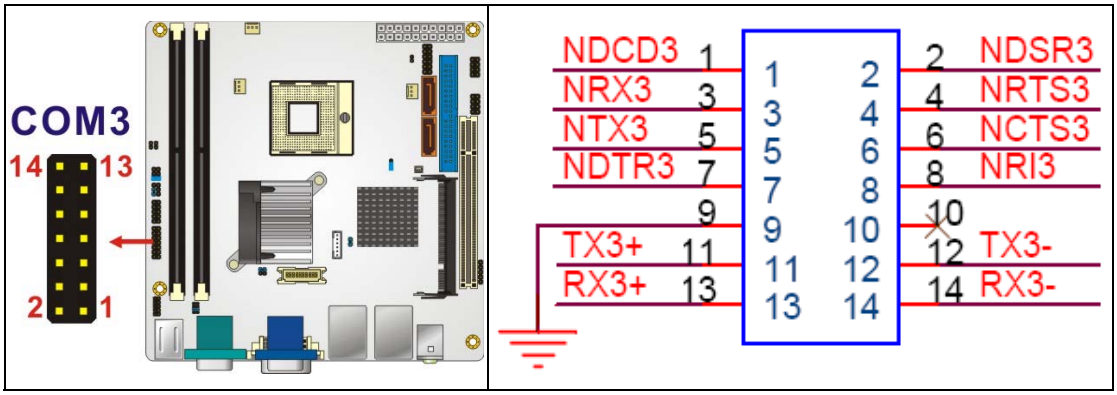


Figure 4-10: 14-Pin Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	NC
11	TX+	12	TX-
13	RX+	14	RX-

Table 4-11: COM2 Pinouts

4.2.10 10-Pin Serial Port Connectors

CN Label: **COM4**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-11**

CN Pinouts: See **Table 4-12**

The serial ports connectors connect to RS-232 serial port device.

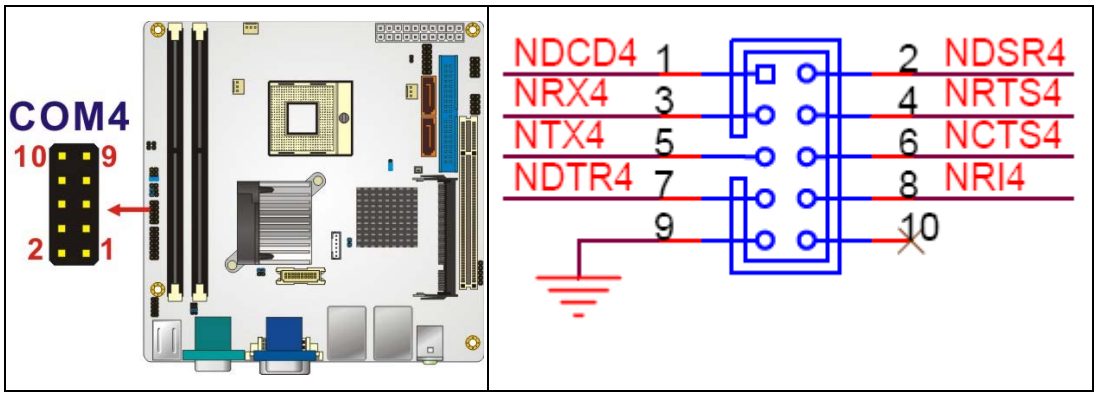


Figure 4-11: 10-Pin Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	NC

Table 4-12: COM4 Pinouts

4.2.11 SATA Drive Connectors

CN Label: **SATA1** and **SATA2**

CN Type: 7-pin SATA drive connector (1x7)

CN Location: See **Figure 4-12**

CN Pinouts: See **Table 4-13**

The two SATA drive connectors are connected to four SATA drives. SATA drives transfer data at speeds as high as 1.5 Gb/s.

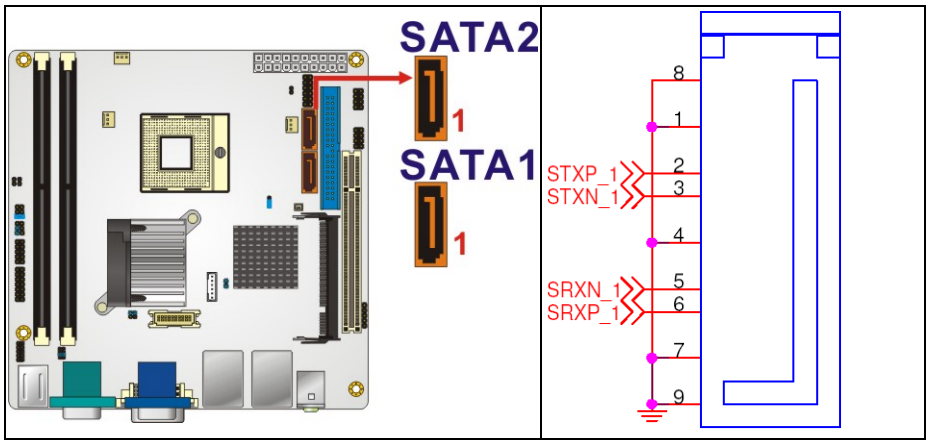


Figure 4-12: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

Table 4-13: SATA Drive Connector Pinouts

4.2.12 SPDIF Connector

CN Label: **SPDIF1**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 4-13**

CN Pinouts: See **Table 4-14**

The SPDIF connector connects to the S/PDIF audio module, which bears S/PDIF digital output. S/PDIF (Sony/Philips Digital Interface) is a newest audio transfer file format, which

allows the user to enjoy digital audio. The SPDIF1 port provides digital audio to external speaker or compressed AC3 data to an external Dolby Digital Decoder via a coaxial cable.

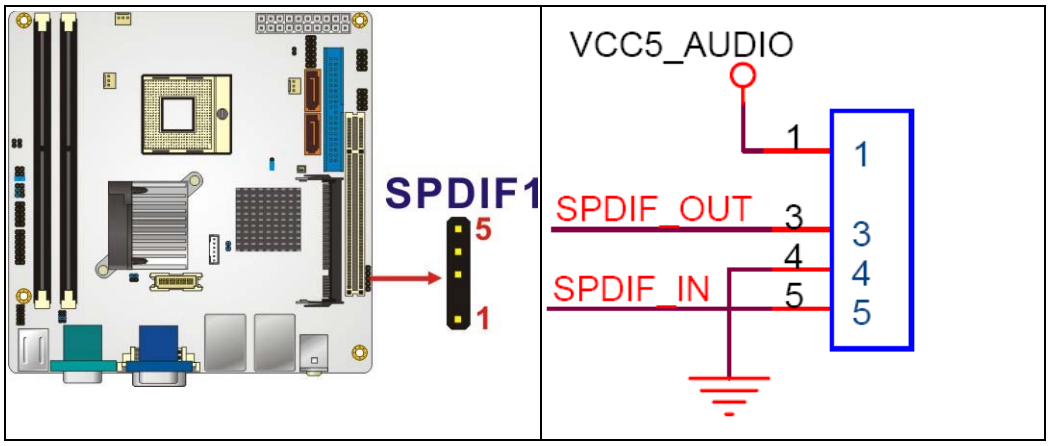


Figure 4-13: SPDIF Connector Locations

PIN NO.	DESCRIPTION
1	+5V
2	(KEY)
3	SPDIF_OUT
4	GND
5	SPDIF_IN

Table 4-14: SPDIF Pinouts

4.2.13 Internal USB Connectors

CN Label: **USB4** and **USB5**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-14**

CN Pinouts: See **Table 4-15**

One 2x4 pin connector provides connectivity to two USB 2.0 ports. The USB ports are used for I/O bus expansion.

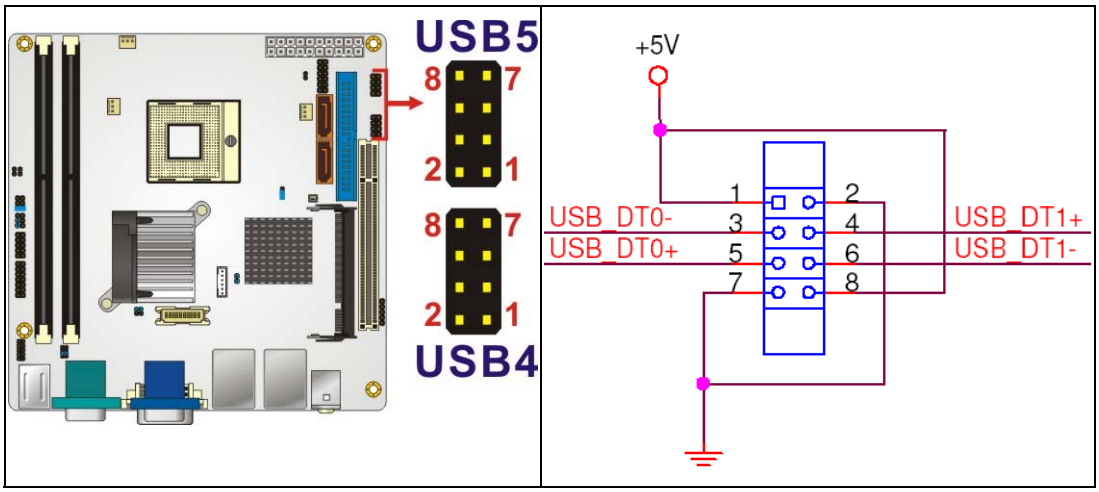


Figure 4-14: Internal USB Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA0-	4	DATA1+
5	DATA0+	6	DATA1-
7	GND	8	VCC

Table 4-15: USB3 and USB4 Pinouts

4.3 External Interface Connectors

The peripheral connectors on the back panel are connected to devices externally when the KINO-9453 is installed in a chassis. The peripheral connectors on the rear panel are:

- 2 x Audio jacks
- 1 x VGA connector
- 2 x RJ-45 Ethernet connectors
- 2 x Keyboard/mouse connectors
- 2 x Serial port connectors
- 1 x DVI connector
- 4 x USB 2.0 connectors

Figure 4-15: KINO-9453 External Interface Connectors

4.3.1 Audio Connectors

CN Label: **AUDIO**

CN Type: Audio jack

CN Location: See **Figure 4-15**

CN Pinouts: See **Figure 4-16**

- **Line Out port (Lime):** Connects a headphone or a speaker. In 4,6,8-channel configuration, the function of this port becomes Front Speaker Out.
- **Microphone (Pink):** Connects a microphone.

Figure 4-16: Audio Connectors

4.3.2 CRT Connector

CN Label: **VIDEO**

CN Type: 15-pin female connector

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-16**

The standard 15-pin VGA connector connects to a CRT or LCD display monitor.

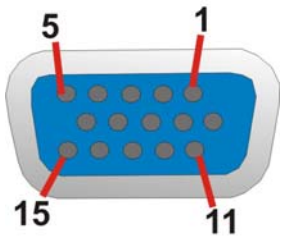


Figure 4-17: VGA Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 4-16: VGA Connector Pinouts

4.3.3 DVI Connector

CN Label: **VIDEO**

CN Type: DVI interface with analog RGB signal

CN Location: See **Figure 4-15**

CN Pinouts: See **Figure 4-18** and **Table 4-17**

The KINO-9453 has an external DVI connector.

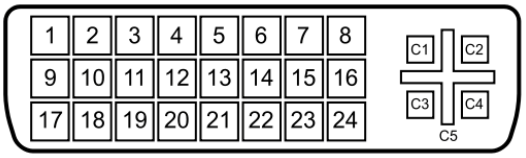


Figure 4-18 DVI-I Connector Pinout Locations

PIN	Description	PIN	Description	PIN	Description
1	DTX2-	9	DTX1-	17	DTX0-
2	DTX2+	10	DTX1+	18	DTX0+
3	GND	11	GND	19	GND
4	N/C	12	N/C	20	N/C
5	N/C	13	N/C	21	N/C
6	SB_CK_C	14	PVDD1	22	GND
6	SB_DA_C	15	GND	23	DTXC+
8	V_SYNC	16	GND	24	DTXC-
C1	R	C3	B	25	GND
C5	GND	C6	GND	26	GND
C2	G	C4	H_SYNC		

Table 4-17: DVI-I Connector Pinouts

4.3.4 Ethernet Connectors

CN Label: **LAN/USB1** and **LAN/USB2**

CN Type: RJ-45

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-18**

The KINO-9453 is equipped with two built-in GbE Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDX0+	5	MDX2-
2	MDX0-	6	MDX1-
3	MDX1+	7	MDX3+
4	MDX2+	8	MDX3-

Table 4-18: LAN1 and LAN2 Pinouts

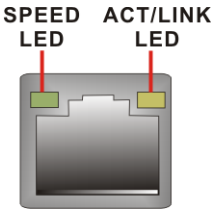


Figure 4-19: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-19**.

SPEED LED		ACT/LINK LED	
STATUS	DESCRIPTION	STATUS	DESCRIPTION
OFF	10Mbps connection	OFF	No link
ORANGE	100Mbps connection	YELLOW	Linked
GREEN	1Gbps connection	BLINKING	Data Activity

Table 4-19: RJ-45 Ethernet Connector LEDs

4.3.5 Keyboard/Mouse Connector

CN Label: **KBMS1**

CN Type: PS/2 connector

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-20** and **Figure 4-20**

The KINO-9453 keyboard and mouse connectors are standard PS/2 connectors.

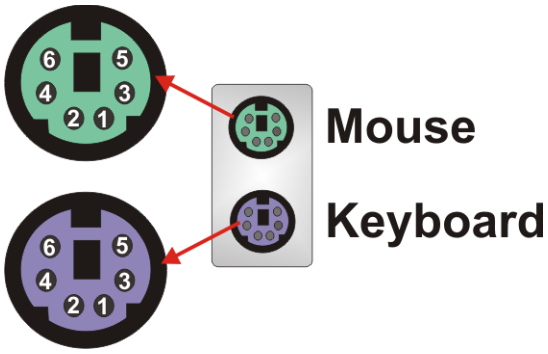


Figure 4-20: PS/2 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC
3	GND	9	GND
4	5V	10	5V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 4-20: PS/2 Connector Pinouts

4.3.6 Serial Port Connectors

CN Label: **COM1/2**

CN Type: DB-9

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-21** and **Figure 4-21**

The serial ports can be connected to a serial communications device directly.

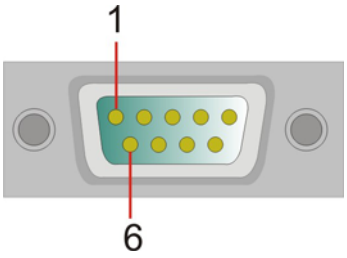


Figure 4-21: External Serial Port Connector

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

Table 4-21: External Serial Port Pinouts

4.3.7 USB Connector

CN Label: **LAN/USB1** and **LAN/USB2**

CN Type: USB port

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-22**

USB devices can be connected directly to the USB connectors on the rear panel.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD1-
3	USBD0+	7	USBD1+
4	GND	8	GND

Table 4-22: External USB Connector Pinouts

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the KINO-9453 may result in permanent damage to the KINO-9453 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-9453. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-9453, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the KINO-9453, place it on an antic-static pad. This reduces the possibility of ESD damaging the KINO-9453.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the KINO-9453 is installed. All installation notices pertaining to the installation of the KINO-9453 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the KINO-9453 and injury to the person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the KINO-9453, KINO-9453 components and injury to the user.

Before and during the installation please **DO** the following:

- **Read the user manual**:
  - The user manual provides a complete description of the KINO-9453 installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD)**:
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place the KINO-9453 on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn all power to the KINO-9453 off**:

- When working with the KINO-9453, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the KINO-9453 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the KINO-9453 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The KINO-9453 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - IDE device
  - SATA drives
  - Keyboard and mouse cable
  - Audio kit
  - Power supply
  - USB cable
  - Serial port cable
  - Parallel port cable
- The following external peripheral devices are properly connected to the chassis:
  - VGA screen

- Keyboard
- Mouse
- RS-232 serial communications device

5.3 CPU, CPU Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, KINO-9453 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the KINO-9453. If one of these component is not installed the KINO-9453 cannot run.

5.3.1 Socket 479 CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket 479 CPU onto the KINO-9453, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Unlock the CPU retention screw.** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 5-1**.

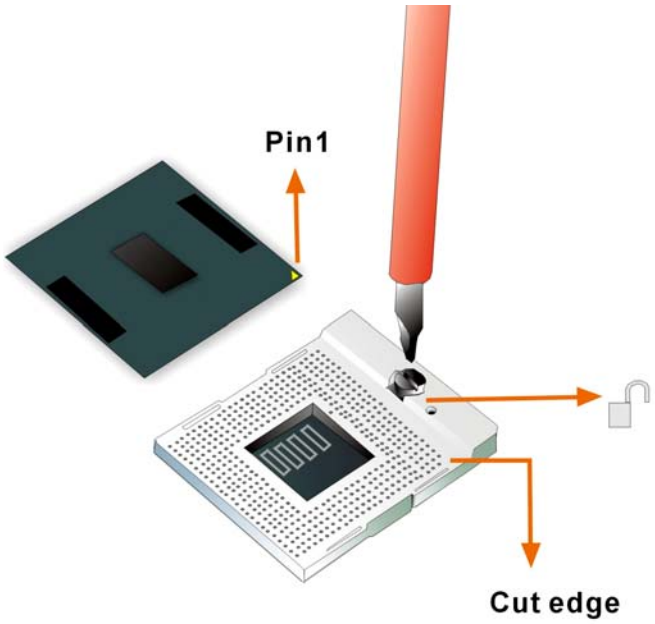


Figure 5-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Correctly Orientate the CPU**. Make sure the IHS (integrated heat sink) side is facing upwards.

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 5-1**.

Step 5: **Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.

Step 6: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

Step 7: **Lock the retention screw.** Rotate the retention screw into the locked position. See **Figure 5-2**.

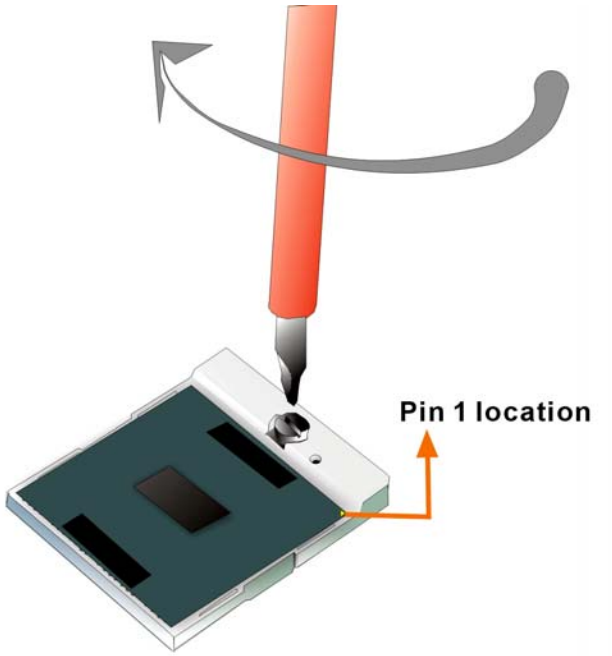


Figure 5-2: Lock the CPU Socket Retention Screw

5.3.2 Cooling Kit CF-479B-RS Installation

Figure 5-3: IEI CF-479B-RS Cooling Kit

An IEI Socket 479 CPU cooling kit can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the CF-479B-RS heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the CF-479B-RS cooling kit, please follow the steps below.

Step 1: **Place the cooling kit onto the CPU**. Make sure the CPU cooling fan cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit**. Make sure its four spring screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 5-4**)

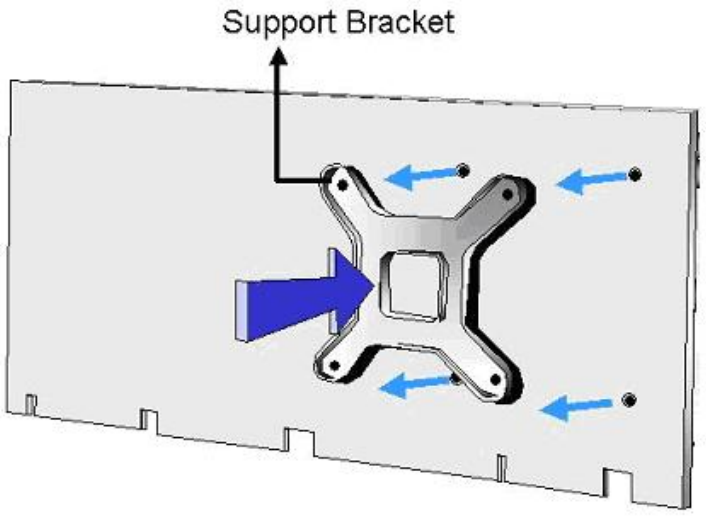


Figure 5-4: Cooling Kit Support Bracket

Step 4: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 5: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades. See **Figure 5-5**.

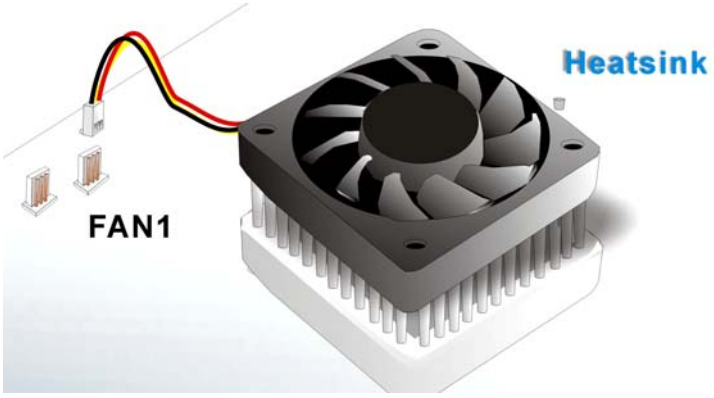


Figure 5-5: Connect the cooling fan cable

5.3.3 DIMM Installation

WARNING:

Only DDR2 memory module can be installed on the KINO-9453. Do not install DDR memory modules. If a DDR memory module is installed on the KINO-9453, the KINO-9453 may be irreparably damaged. Please make sure the purchased DIMM complies with the memory specifications of the KINO-9453. DIMM specifications compliant with the KINO-9453 are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-6**.

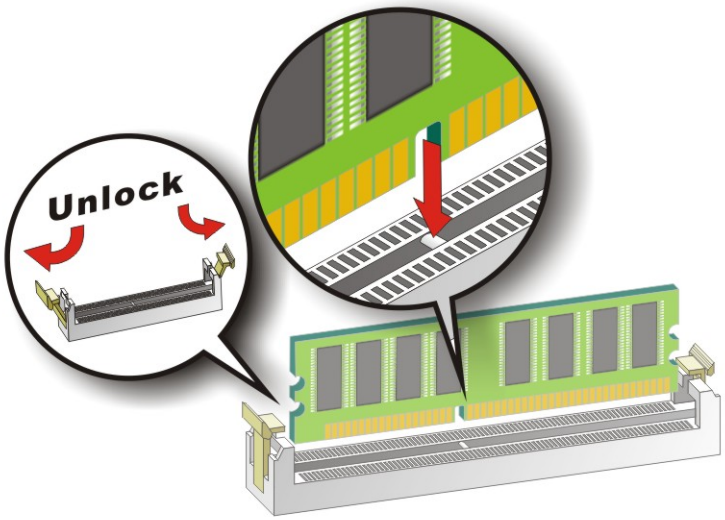


Figure 5-6: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-6**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-6**.

Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-6**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

5.4 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

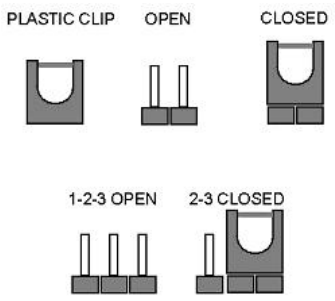


Figure 5-7: Jumper Locations

Before the KINO-9453 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the KINO-9453 are listed in **Table 5-1**.

Description	Label	Type
AT/ATX power mode selection	JP5, JP6	2-pin header
Clear CMOS	JP3	3-pin header
COM3 mode selection	JP1, JP7	6-pin header
LVDS LCD voltage selection	JP4	4-pin header

LVDS screen resolution selection	JP2	8-pin header
RS-422 Termination Resister	JP8	2-pin header
RS-485 Termination Resister	JP9	2-pin header

Table 5-1: Jumpers

5.4.1 AT/ATX Power Select Jumper Settings

Jumper Label: **JP5** and **JP6**

Jumper Type: 2-pin header

Jumper Settings: See **Table 5-2**

Jumper Location: See Figure 5-8

The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX. AT/ATX Power Select jumper settings are shown in **Table 5-2**.

JP5	Description	
Short	Use ATX power	Default
Open	Use AT power	
JP6	Description	
Short	Use AT power	
Open	Use ATX power	Default

Table 5-2: AT/ATX Power Select Jumper Settings

The location of the AT/ATX Power Select jumper is shown in **Figure 5-8** below.

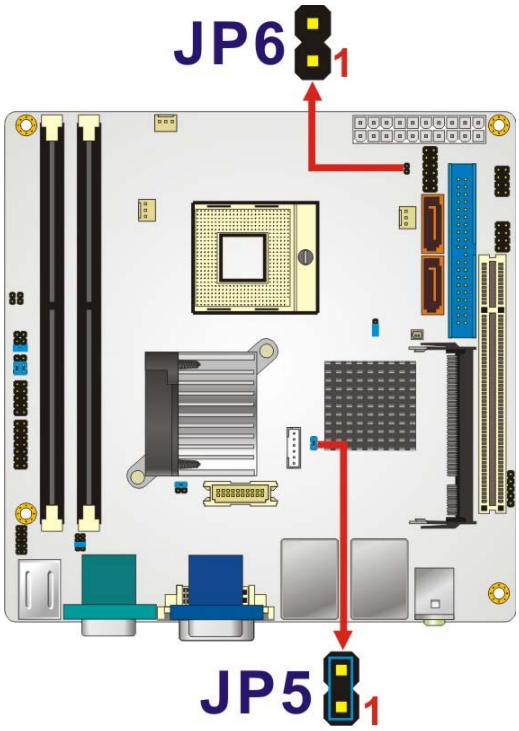


Figure 5-8: AT/ATX Power Select Jumper Location

5.4.2 Clear CMOS Jumper

Jumper Label:	**JP3**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-3**
Jumper Location:	See **Figure 5-9**

If the KINO-9453 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-3**.

Clear CMOS	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 5-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-9** below.

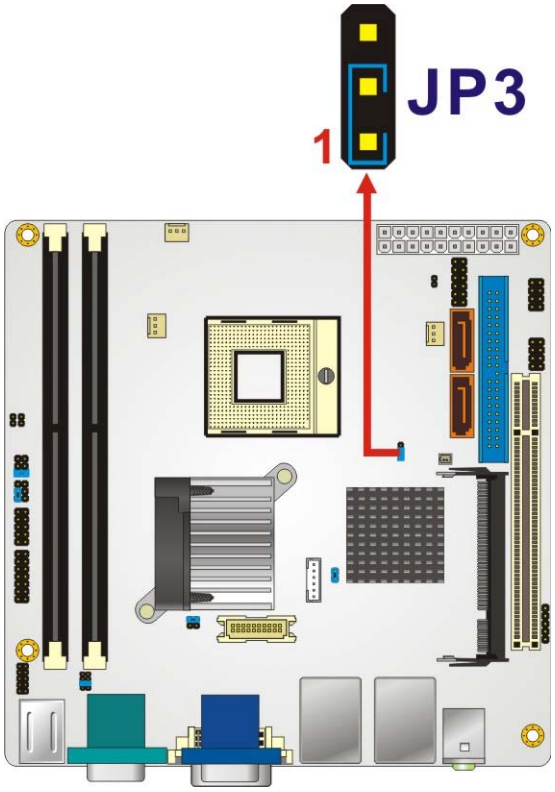


Figure 5-9: Clear CMOS Jumper

5.4.3 COM 3 Function Select Jumper

Jumper Label:	**JP1** and **JP7**
Jumper Type:	6-pin header
Jumper Settings:	See **Table 5-4**
Jumper Location:	See **Figure 5-10**

The COM 3 Function Select jumper sets the communication protocol used by the second serial communications port (COM 3) as RS-232, RS-422 or RS-485. The COM 3 Function Select settings are shown in **Table 5-4**.

JP1	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	
JP7	Description	
Short 1-3, 2-4	RS-232	Default
Short 3-5, 4-6	RS-485	

Table 5-4: COM 3 Function Select Jumper Settings

The COM 3 Function Select jumper location is shown in **Figure 5-10**.

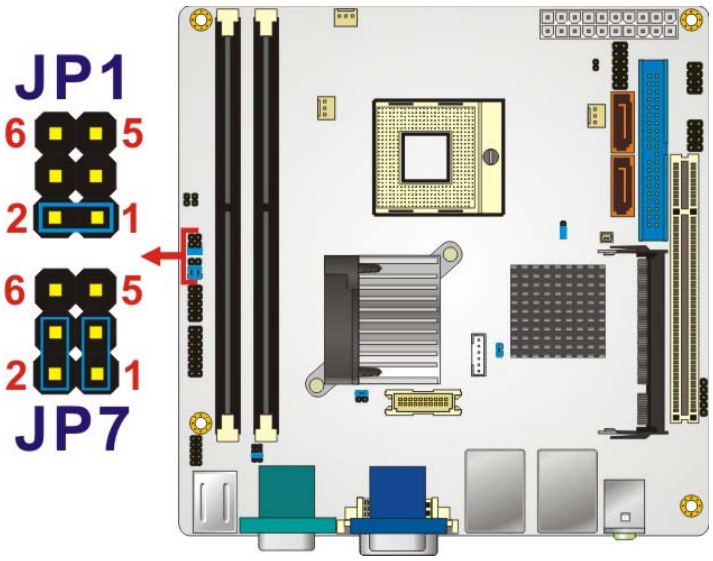


Figure 5-10: COM 3 Function Select Jumper Locations

5.4.4 RS-422 or RS-486 Termination Resister

Jumper Label:	**JP8** and **JP9**
Jumper Type:	2-pin header
Jumper Settings:	See Table 5-5 and Table 5-6
Jumper Location:	See Figure 5-11

The JP8 sets the RS-422 Termination Resister while JP9 sets the RS-485 Termination Resister. The RS-422 and RS-485 Termination Resister settings are shown in Table 5-5 and Table 5-6.

JP8	Description	
Open	Normal Operation	Default
Short	Termination Resister Setting	

Table 5-5: RS-422 Termination Resister Jumper Settings

JP9	Description	
Open	Normal Operation	Default
Short	Termination Resister Setting	

Table 5-6: RS-485 Termination Resister Jumper Settings

The RS-422 or RS-485 Termination Resister jumper location is shown in Figure 5-11.

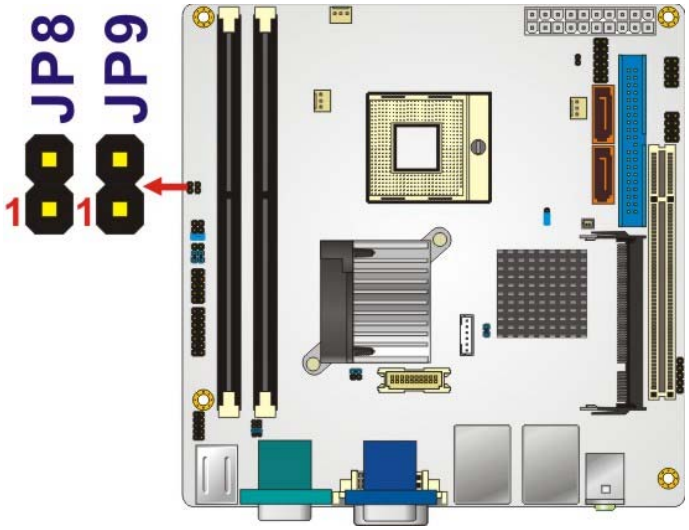


Figure 5-11: RS-422 and RS-485 Termination Resister Jumper Locations

5.4.5 LVDS Screen Resolution Selection

Jumper Label: **JP2**

Jumper Type: 8-pin header

Jumper Settings: See **Table 5-8**

Jumper Location: See **Figure 5-13**

The **LVDS Screen Resolution Selection** jumper allows the LVDS screen resolution to be set. The **LVDS Screen Resolution Selection** jumper settings are shown in **Table 5-8**.

LVDS Resolution Select	Description	
Open	By BIOS setting	
Short 3-4	800 x 600 (18-bit)	Default
Short 5-6	1024 x 768 (24-bit)	
Short 1-2, 3-4	1024 x 768 (18-bit)	
Short 1-2, 3-4, 5-6	1600 x 1200 (48-bit)	
Short 3-4, 5-6	1280 x 1024 (48-bit)	
Short 7-8	1280 x 768 (18-bit)	
Short 1-2, 7-8	1280 x 800 (18-bit)	
Short 3-4, 7-8	1366 x 768 (18-bit)	
Short 1-2, 3-4, 7-8	1440 x 900 (36-bit)	
Short 5-6, 7-8	1440 x 900 (48-bit)	
Short 1-2, 5-6, 7-8	1680 x 1050 (48-bit)	

Table 5-7: LVDS Screen Resolution Selection Jumper Settings

The **LVDS Screen Resolution Selection** jumper location is shown in **Figure 5-13**.

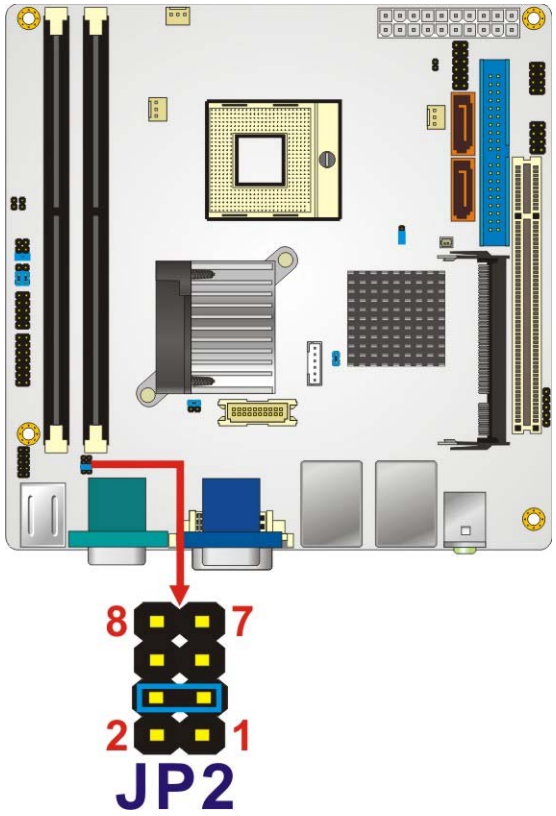


Figure 5-12: LVDS Screen Resolution Selection Jumper Pinout Locations

5.4.6 LVDS Voltage Selection

WARNING:

Permanent damage to the screen and KINO-9453 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that cam with the monitor to select the correct voltage.

Jumper Label:	**JP4**
Jumper Type:	4-pin header
Jumper Settings:	See **Table 5-8**
Jumper Location:	See **Figure 5-13**

The **LVDS Voltage Selection** jumper allows the LVDS screen voltage to be set. The **LVDS Voltage Selection** jumper settings are shown in **Table 5-8**.

LVDS Voltage Select	Description	
Short 1-2	+3V	Default
Short 3-4	+5V	

Table 5-8: LVDS Voltage Selection Jumper Settings

The LVDS Voltage Selection jumper location. is shown in **Figure 5-13**.

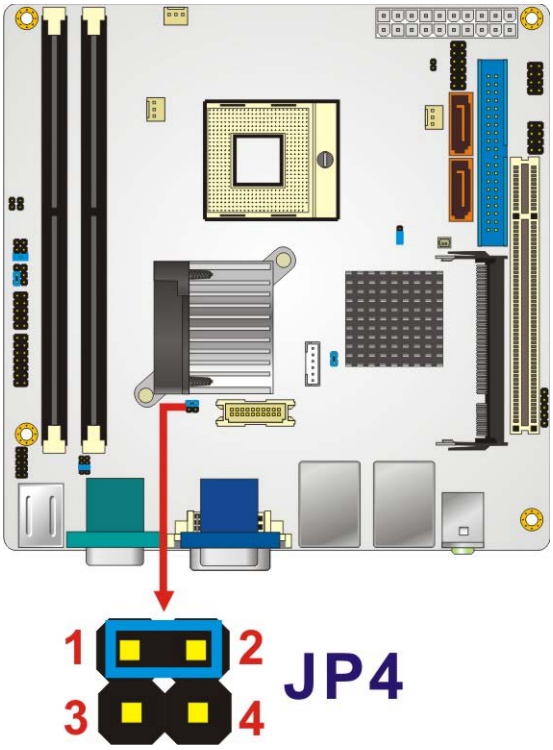


Figure 5-13: LVDS Voltage Selection Jumper Pinout Locations

5.5 Chassis Installation

5.5.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the KINO-9453 must have air vents to allow cool air to move into the system and hot air to move out.

The KINO-9453 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

NOTE:

IEI has a wide range of backplanes available. Please contact your KINO-9453 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

5.5.2 Motherboard Installation

To install the KINO-9453 motherboard into the chassis please refer to the reference material that came with the chassis.

5.6 Internal Peripheral Device Connections

5.6.1 Peripheral Device Cables

The cables listed in **Table 5-9** are shipped with the KINO-9453.

Quantity	Type
1	IDE Cable
1	Dual RS-232 cable
2	SATA drive cables
1	SATA drive power cable

Table 5-9: IEI Provided Cables

Optional cables are listed below:

- USB cable (dual port)
- USB cable (four port)
- RS-232/422/485 cable

5.6.2 IDE Cable Connection

The IDE flat cable connects to the KINO-9453 to one or two IDE devices. To connect an IDE HDD to the KINO-9453, please follow the instructions below.

Step 1: **Locate the IDE connector**. The location/s of the IDE device connector/s is/are shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 5-14**. A key on the front of the cable connector ensures it can only be inserted in one direction.

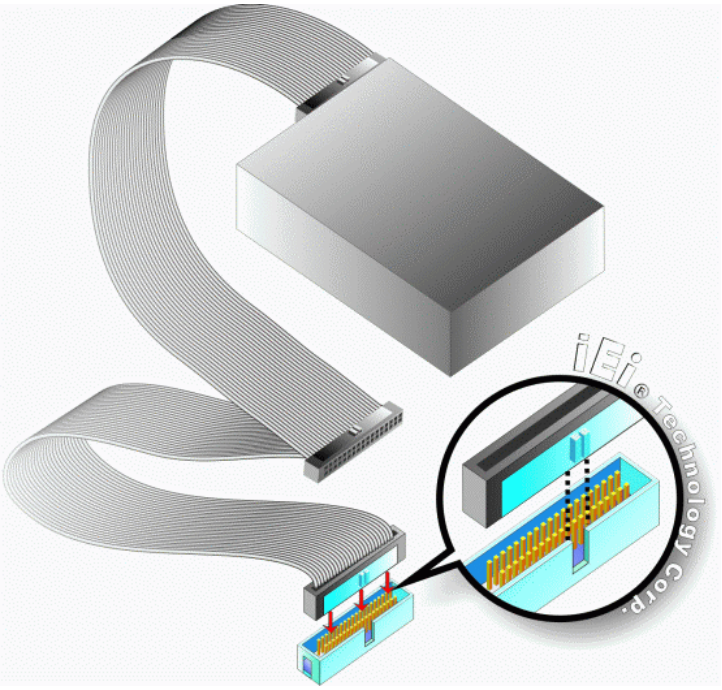


Figure 5-14: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

5.6.3 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-15**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

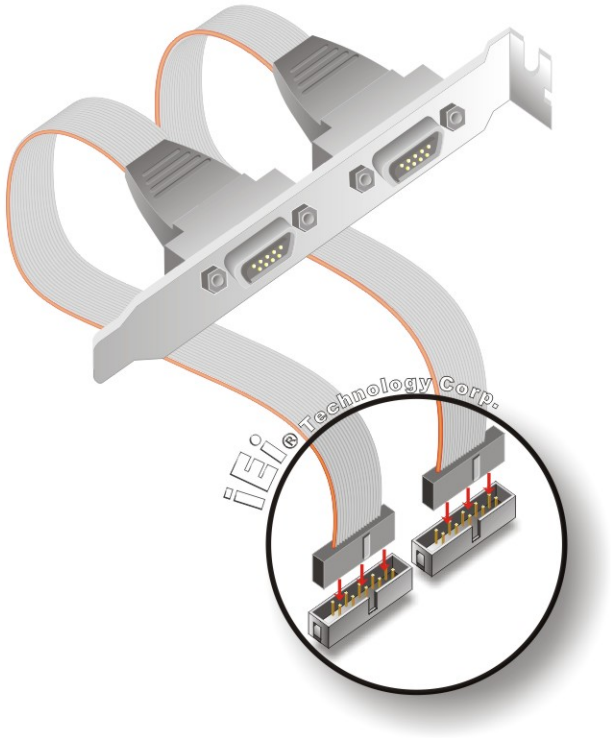


Figure 5-15: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis

5.6.4 SATA Drive Connection

The KINO-9453 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-16**.

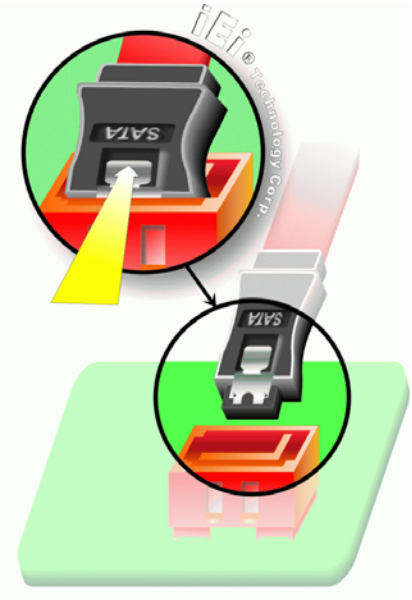


Figure 5-16: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-17**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-17**.

Figure 5-17: SATA Power Drive Connection

5.7 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio devices
- RJ-45 Ethernet cable
- USB devices
- VGA monitors
- DVI port devices
- Serial port devices
- Mouse and keyboard

To install these devices, connect the corresponding cable connector from the actual device to the corresponding KINO-9453 external peripheral interface connector making sure the pins are properly aligned.

5.7.1 Audio Connection

Audio signals are interfaced through two phone jack connections. The red phone jack is for Line Out and green is for MIC In. Follow the steps below to connect audio devices to the KINO-9453.

Step 1: **Locate the audio phone jacks**. The location of the audio phone jacks are shown in **Chapter 3**.

Step 2: **Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See **Figure 5-18**.

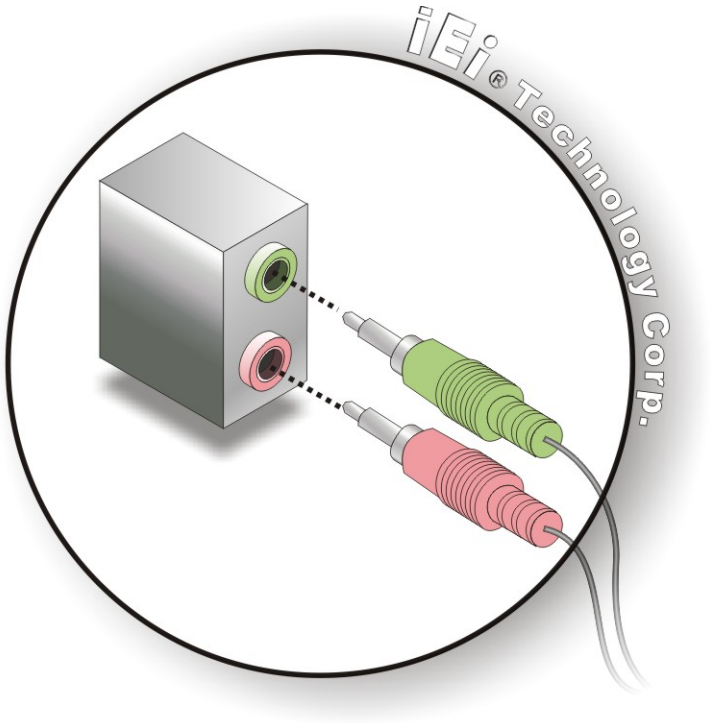


Figure 5-18: Audio Connectors

5.7.2 RJ-45 Ethernet Connection

The KINO-9453 has two RJ-45 Ethernet connectors on the external peripheral interface panel for LAN communications. Follow the steps below to connect an RJ-45 Ethernet connector to the KINO-9453.

Step 1: **Locate the RJ-45 connector**. The location of the RJ-45 connector is shown in **Chapter 3**.

Step 2: **Insert an RJ-45 plug**. Insert the RJ-45 plug of a LAN into the RJ-45 receptacle on the external peripheral interface. See **Figure 5-19**.

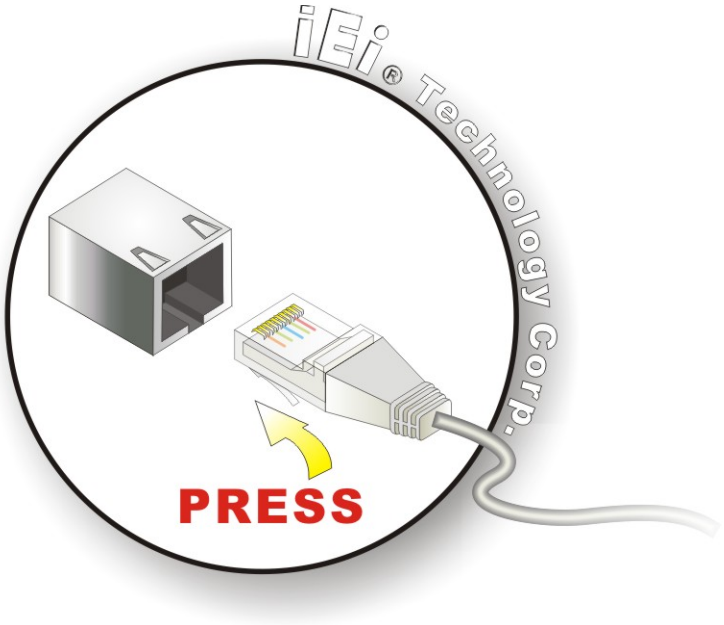


Figure 5-19: RJ-45 Ethernet Connector

5.7.3 USB Connection

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the KINO-9453.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 5-20**.

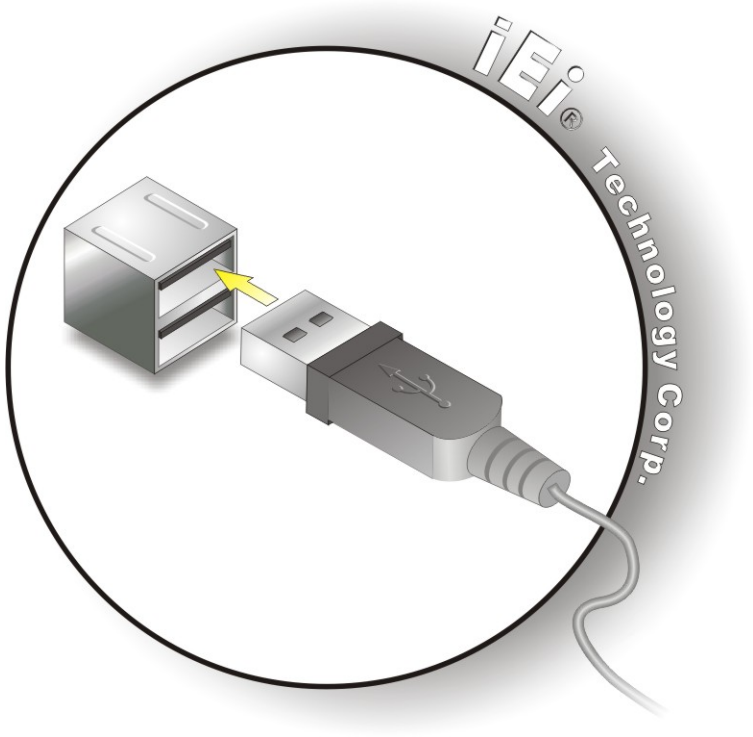


Figure 5-20: USB Connector

5.7.4 VGA Monitor Connection

The KINO-9453 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the KINO-9453, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the KINO-9453. See **Figure 5-21**.

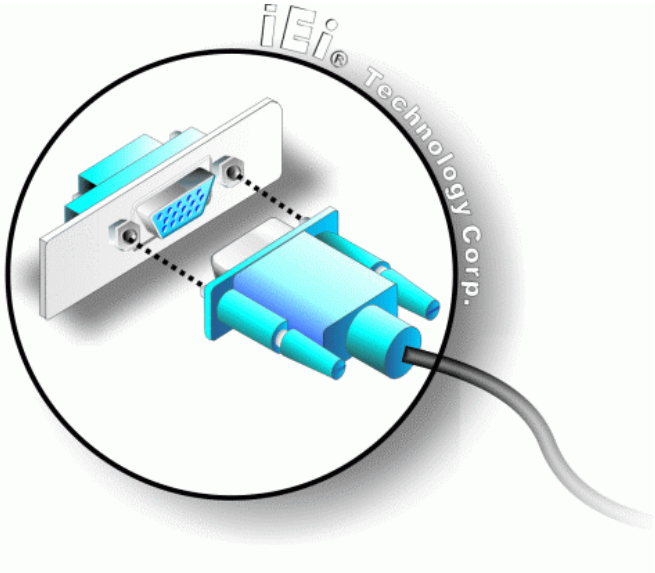


Figure 5-21: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

5.7.5 Serial Device Connection

The KINO-9453 has two female DB-9 connectors on the external peripheral interface panel for serial devices. Follow the steps below to connect a serial device to the KINO-9453.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 5-22**.

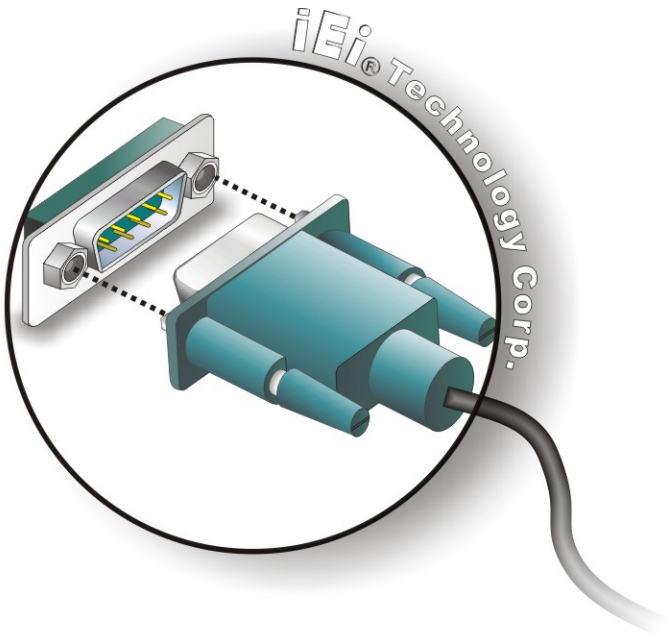


Figure 5-22: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

5.7.6 PS/2 Keyboard/Mouse Connection

The KINO-9453 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the KINO-9453.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See **Figure 5-23**.

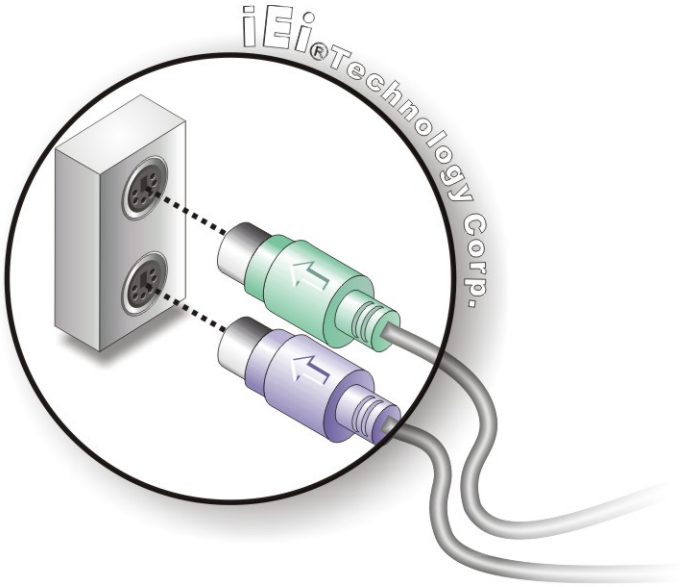


Figure 5-23: PS/2 Keyboard/Mouse Connector

Chapter

6

AMI BIOS

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

Key	Function
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5**.

6.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

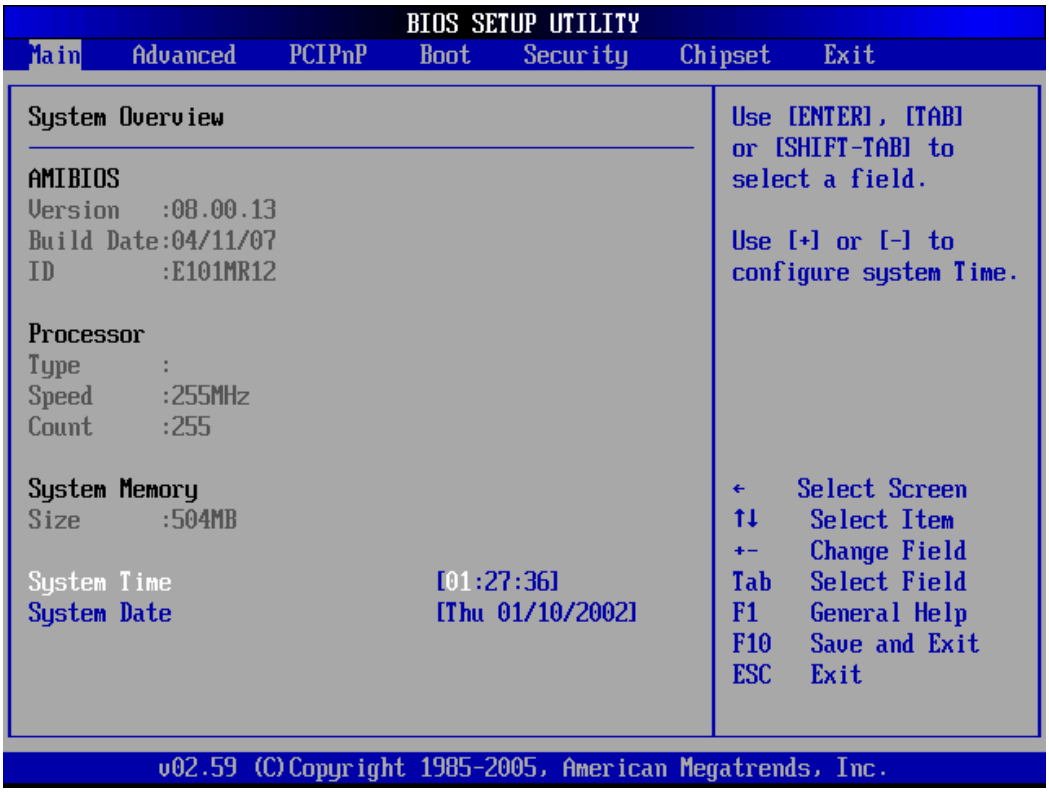
- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor

- **Speed**: Lists the processor speed
- **Count**: The number of CPUs on the motherboard

- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The **System Overview** field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

6.3 Advanced

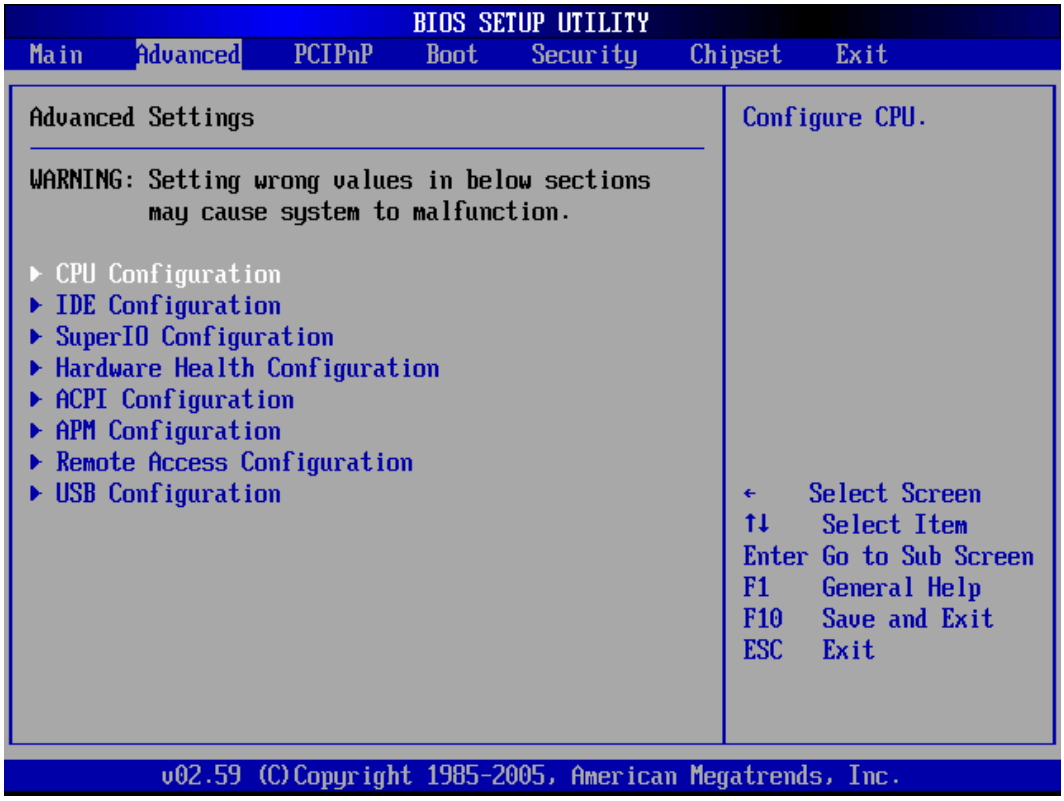
Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- **CPU Configuration** (see **Section 6.3.1**)
- **IDE Configuration** (see **Section 6.3.2**)
- **SuperIO Configuration** (see **Section 6.3.3**)
- **Hardware Health Configuration** (see **Section 6.3.4**)
- **ACPI Configuration** (see **Section 6.3.5**)
- **APM Configuration** (See **Section 6.3.6**)

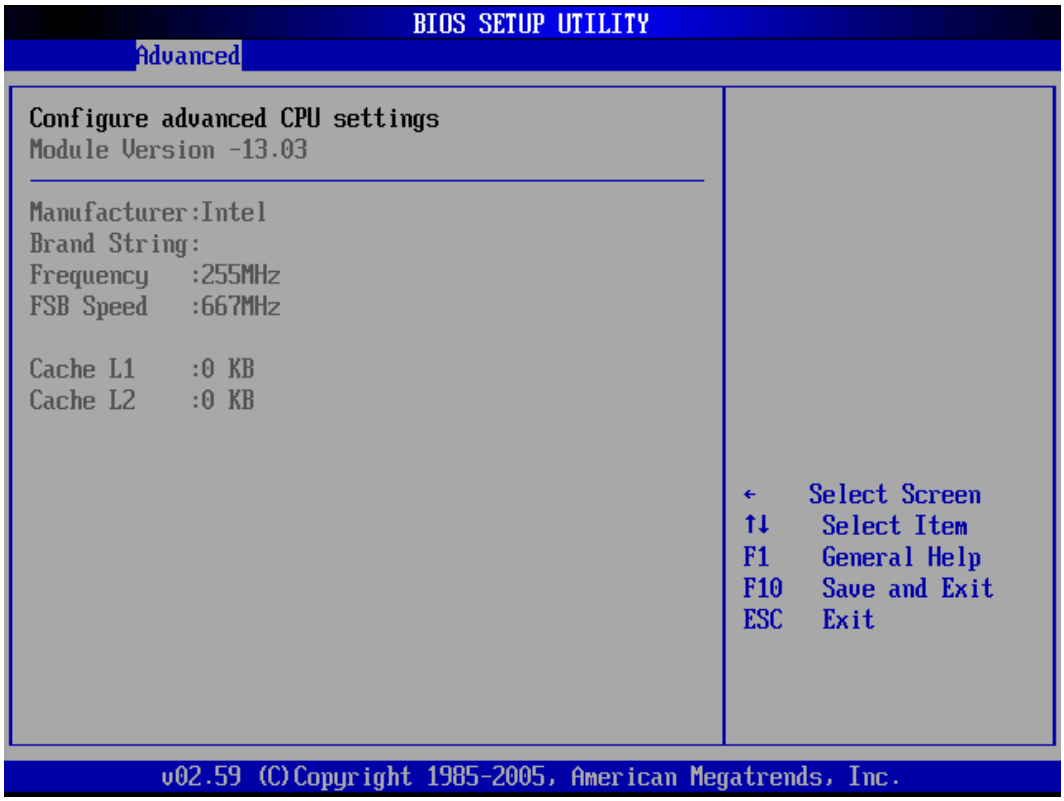
- **Remote Access Configuration** (see **Section 6.3.7**)
- **USB Configuration** (see **Section 6.3.8**)



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



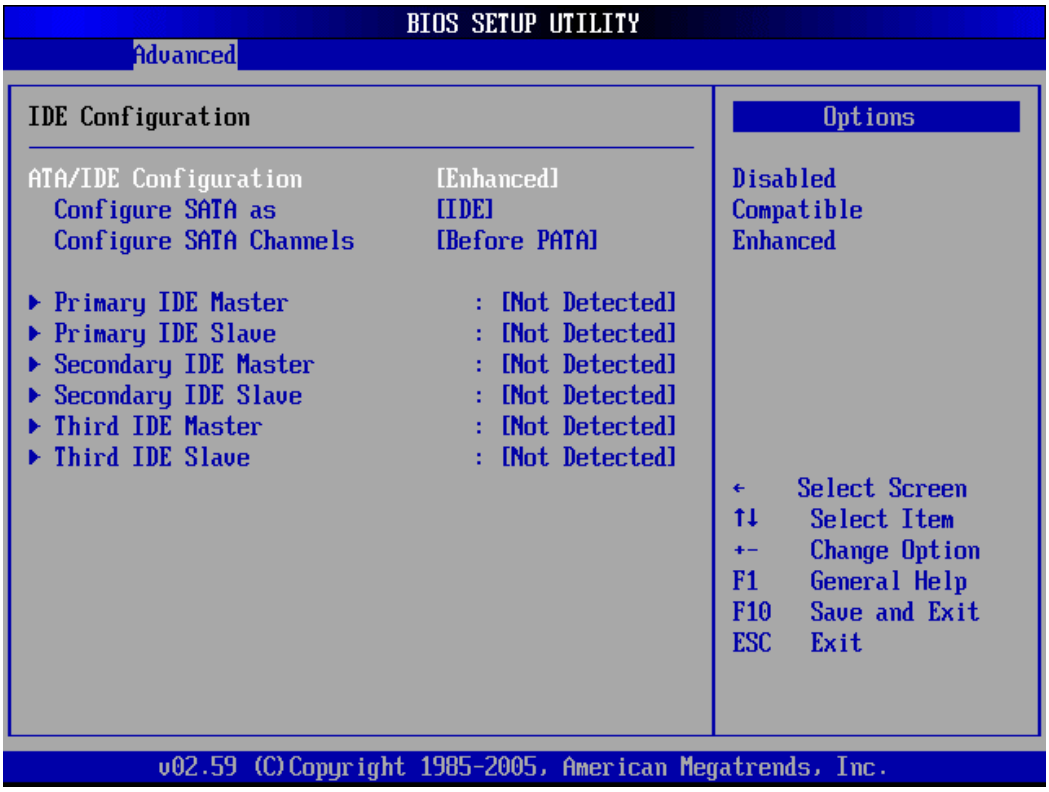
BIOS Menu 3: CPU Configuration

The **CPU Configuration** menu (**BIOS Menu 3**) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Brand String**: Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size

6.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configuration [Enhanced]**

The **ATA/IDE Configuration** BIOS option allows the user to configure the ATA/IDE device mode.

➔ **Disabled** Disable all ATA/IDE ports. No Primary/Secondary IDE mode is presented for configuration

➔ **Compatible** Up to 6 HDDs can be used, four for SATA and the other for PATA IDE. If this option is selected, “Legacy IDE Channels” option is presented for configuration.

➔ **Enhanced** **DEFAULT** The motherboard allows up to 6 HDDs to use and SATA drives can be configured into RAID volumes. If this option is selected, “Configure SATA as” and “Configure

SATA channels" options are presented for configuration.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to specify how to configure the available SATA devices.

➔ **IDE**	**DEFAULT**	Enables the SATA devices as IDE devices
➔ **RAID**		Enables the SATA devices as a RAID device
➔ **AHCI**		Enables Native Command Queuing (NCQ) and SATA hot plug capability If AHCI is chosen, enable the stagger Spinup Support and take all hard disks on board as master

➔ **Configure SATA Channels [Before PATA]**

Use **Configure SATA Channels** option to specify how to configure the available SATA devices.

➔ **Behind PATA**		The system detects the SATA devices after the IDE devices
➔ **Before PATA**	**DEFAULT**	The system detects the SATA devices before the IDE devices

➔ **IDE Master and IDE Slave**

When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

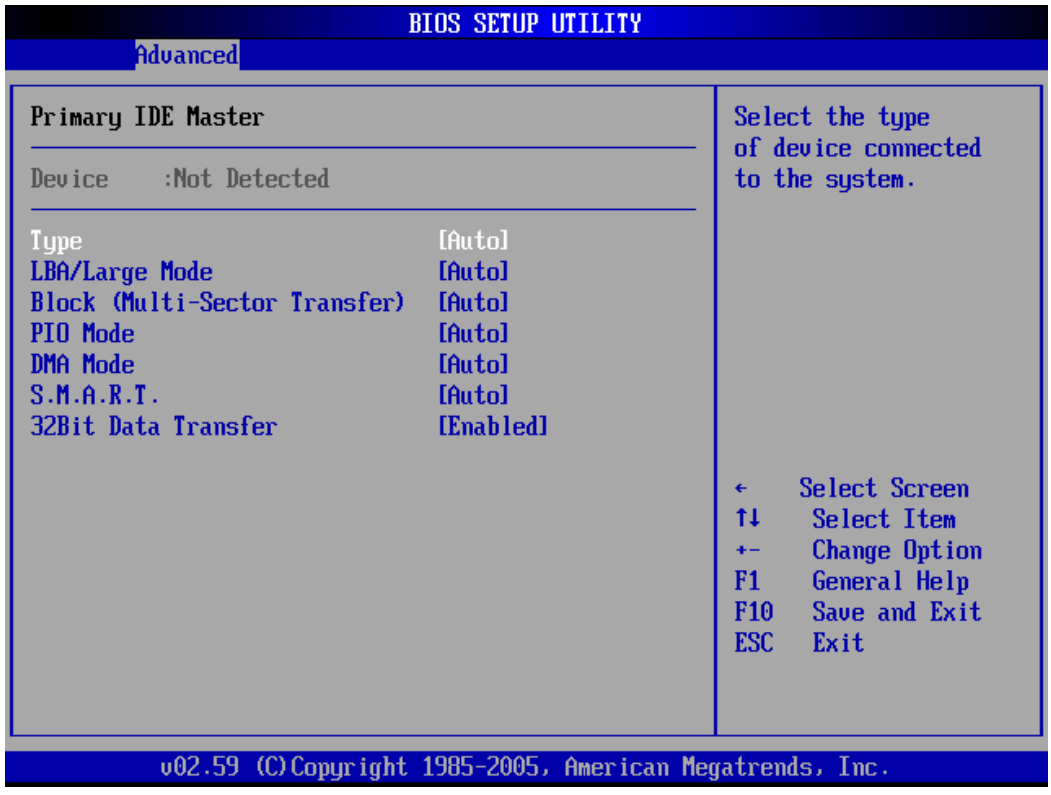
- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master

- Secondary IDE Slave
- Third IDE Master
- Third IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

- **Not Installed** — BIOS is prevented from searching for an IDE disk drive on the specified channel.
- **Auto** **DEFAULT** — The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
- **CD/DVD** — The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
- **ARMD** — This option specifies an ATAPI Removable Media Device. These include, but are not limited to:
  - **ZIP**
  - **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

- **Disabled** — BIOS is prevented from using the LBA mode control on the specified channel.
- **Auto** **DEFAULT** — BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi-Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**		BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
➔ **Auto**	**DEFAULT**	BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	**DEFAULT**	BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
➔ **0**		PIO mode 0 selected with a maximum transfer rate of 3.3MBps
➔ **1**		PIO mode 1 selected with a maximum transfer rate of 5.2MBps
➔ **2**		PIO mode 2 selected with a maximum transfer rate of 8.3MBps
➔ **3**		PIO mode 3 selected with a maximum transfer rate of 11.1MBps
➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6MBps (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔ **SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
➔ **SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
➔ **SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
➔ **MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
➔ **MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
➔ **MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
➔ **UDMA2**		Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
➔ **UDMA3**		Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.

➔ **Disabled** Prevents BIOS from using the HDD SMART feature.

➔ **Enabled** Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

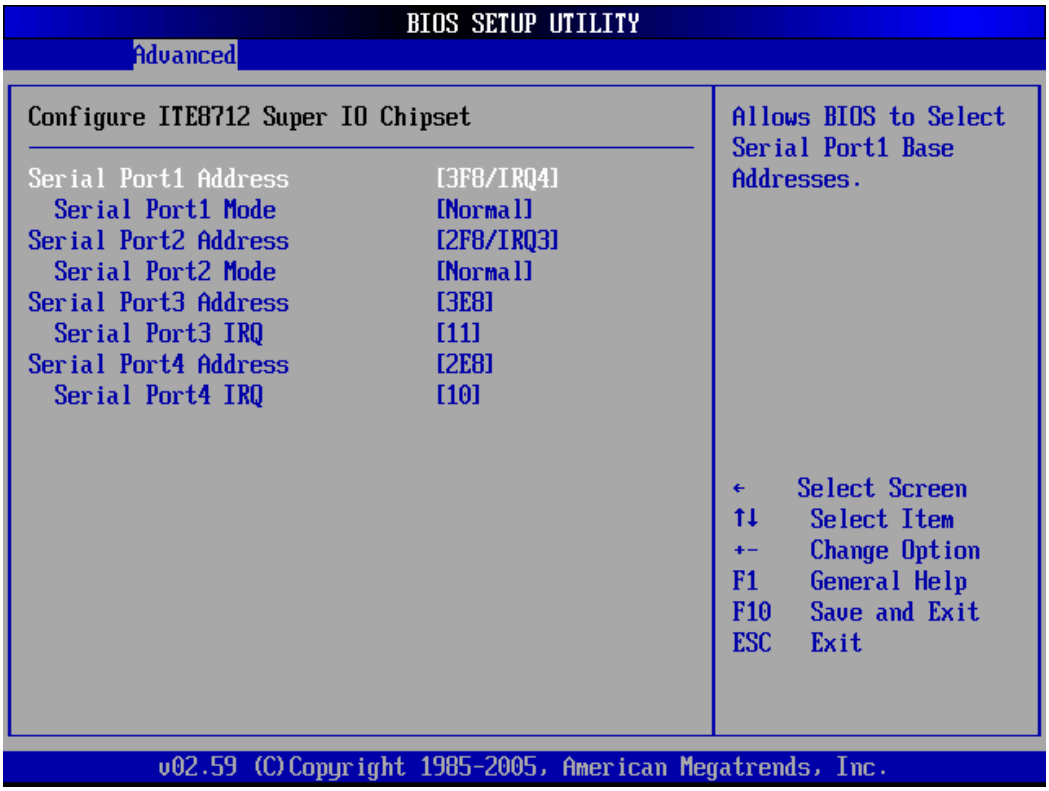
Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

6.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ Serial Port1 Address [3F8/IRQ4]

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	**DEFAULT**	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port1 Mode [Normal]**

Use the **Serial Port1 Mode** option to select the transmitting and receiving mode for the first serial port.

➔ **Normal**	(Default)	Serial Port 1 mode is normal
➔ **IrDA**		Serial Port 1 mode is IrDA
➔ **ASK IR**		Serial Port 1 mode is ASK IR

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

➔ **Normal**	**DEFAULT**	Serial Port 2 mode is normal
➔ **IrDA**		Serial Port 2 mode is IrDA
➔ **ASK IR**		Serial Port 2 mode is ASK IR

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

- **Disabled** No base address is assigned to serial port 3
- **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8
- **2E8** Serial port 3 I/O port address is 2E8
- **2F0** Serial port 3 I/O port address is 2F0
- **2E0** Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- **10** Serial port 3 IRQ address is 10
- **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- **Disabled** No base address is assigned to serial port 3
- **3E8** Serial port 4 I/O port address is 3E8
- **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8
- **2F0** Serial port 3 I/O port address is 2F0
- **2E0** Serial port 4 I/O port address is 2E0

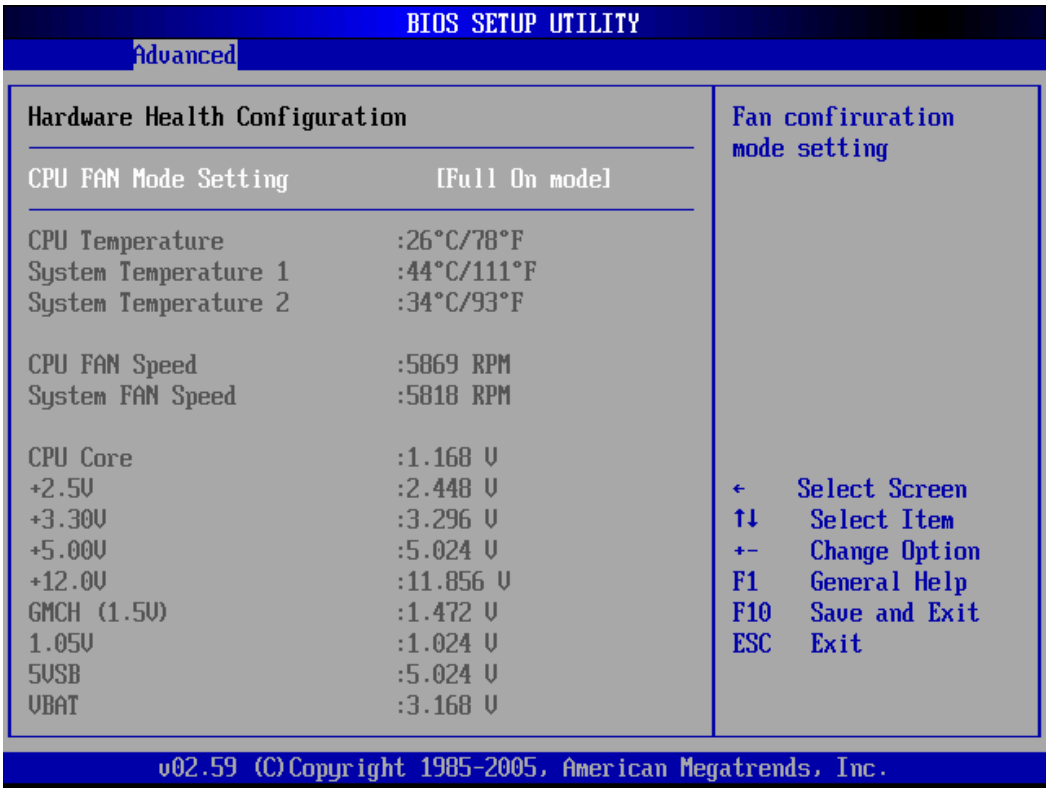
➔ **Serial Port4 IRQ [10]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- **10** **DEFAULT** Serial port 4 IRQ address is 10
- **11** Serial port 4 IRQ address is 11

6.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 7: Hardware Health Configuration

➔ **CPU FAN Mode Setting [Full On Mode]**

Use the **CPU FAN Mode Setting** option to configure the second fan.

➔ **Full On Mode**	**DEFAULT**	Fan is on all the time
➔ **Automatic mode**		Fan is off when the temperature is low enough. Parameters must be set by the user.
➔ **PWM Manual mode**		Pulse width modulation set manually

When the **CPU FAN Mode Setting** option is in the **Automatic Mode**, the following parameters can be set.

- CPU Temp. Limit of OFF
- CPU Temp. Limit of Start
- CPU Temp. Limit of Full
- CPU Fan Start PWM
- Slope PWM 1

When the **CPU FAN Mode Setting** option is in the **PWM Manual Mode**, the following parameters can be set.

- CPU Fan PWM control

➔ **CPU Temp. Limit of OFF [000]**

WARNING:

Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of OFF** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of OFF** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value, select the **CPU Temp. Limit of OFF** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- **Minimum Value**: 0°C
- **Maximum Value**: 127°C

➔ **CPU Temp. Limit of Start [020]**

WARNING:

Setting this value too high may cause the fan to start only when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of Start** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of Start** option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the **CPU Fan Start PWM** option below. To select a value, select the **CPU Temp. Limit of Start** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- **Minimum Value**: 0°C
- **Maximum Value**: 127°C

➔ **CPU Temp. Limit of Full [080]**

WARNING:

Setting this value too high may cause the fan to start rotating at full speed only when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of Full** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of Full** option to select the CPU temperature at which the cooling fan starts to rotate at full speed. When the CPU temperature exceeds the temperature specified in this option, the fan starts to rotate at full

speed. To select a value, select the **CPU Temp. Limit of Full** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- **Minimum Value**: 0°C
- **Maximum Value**: 127°C

➔ **CPU Fan Start PWM [070]**

The **CPU Fan Start PWM** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Fan Start PWM** option to select the PWM mode the fan starts to rotate with after the temperature specified in the **CPU Temp. Limit of Start** is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the **CPU Fan Start PWM** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- **PWM Minimum Mode**: 0
- **PWM Maximum Mode**: 127

➔ **Slope PWM 1 [1 PWM]**

The **Slope PWM 1** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Slope PWM 1** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

- 0 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 16 PWM
- 32 PWM
- 64 PWM

➔ **CPU Fan PWM Control [100]**

The **CPU Fan PWM Control** option can only be set if the **CPU FAN Mode Setting** option is set to **Manual Mode**. Use the **CPU Fan PWM Control** option to select PWM duty cycle control. The PWM duty cycle specifies the width of the modulated pulse. A high value ensures a wide pulse and a low value ensures a narrow pulse. To select a value, select the **CPU Fan PWM Control** option and enter a decimal number between 000 and 127. The PWM Duty Cycle control range is specified below.

- **PWM Minimum Mode**: 0
- **PWM Maximum Mode**: 127

➔ **Hardware Health Monitoring**

Use the **Hardware Health Configuration** menu (**BIOS Menu 7**) monitor system environmental parameters. The following health parameters are monitored.

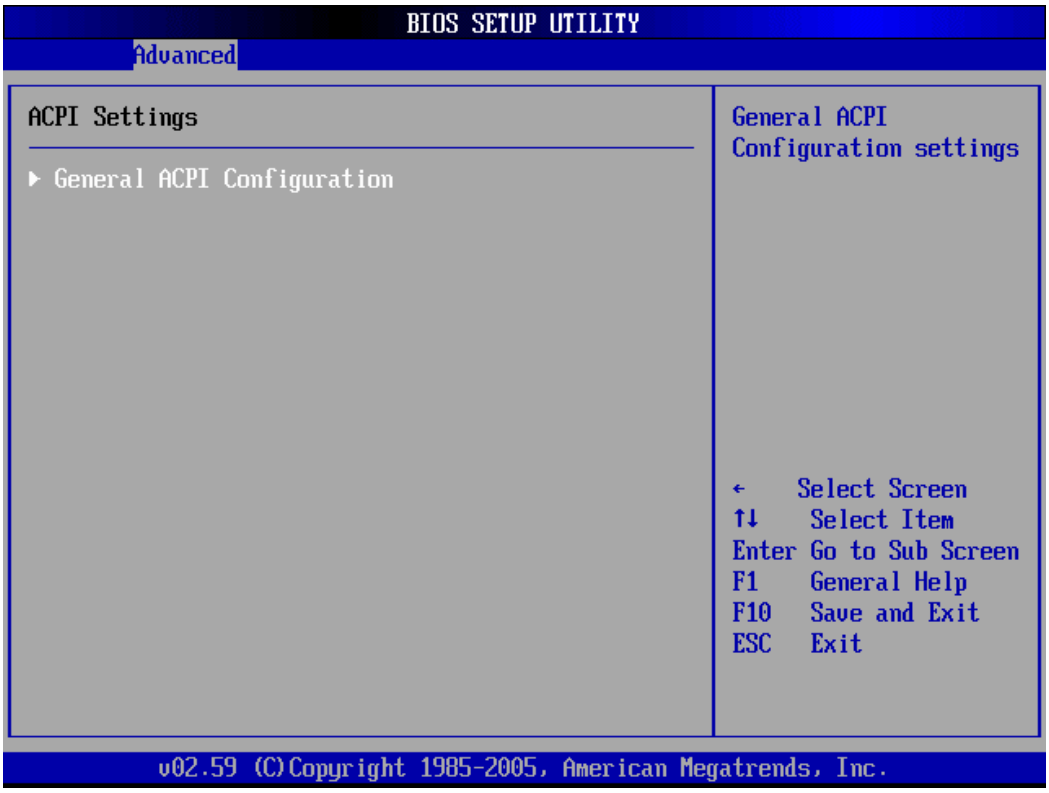
- **Temperature monitoring:** The following system temperatures are monitored:
  - CPU Temperature
  - System Temperature 1
  - System Temperature 2

- **Fan Speed Monitoring:** The following system fan speeds are monitored:
  - CPU FAN Speed
  - System FAN Speed

- **Voltage Monitoring:** The following system voltages are monitored:
  - CPU Core
  - +2.5V
  - +3.30V
  - +5.00V
  - +12.0V
  - GMCH (1.5V)
  - 1.05V
  - 5VSB
  - VBAT

6.3.5 ACPI Configuration

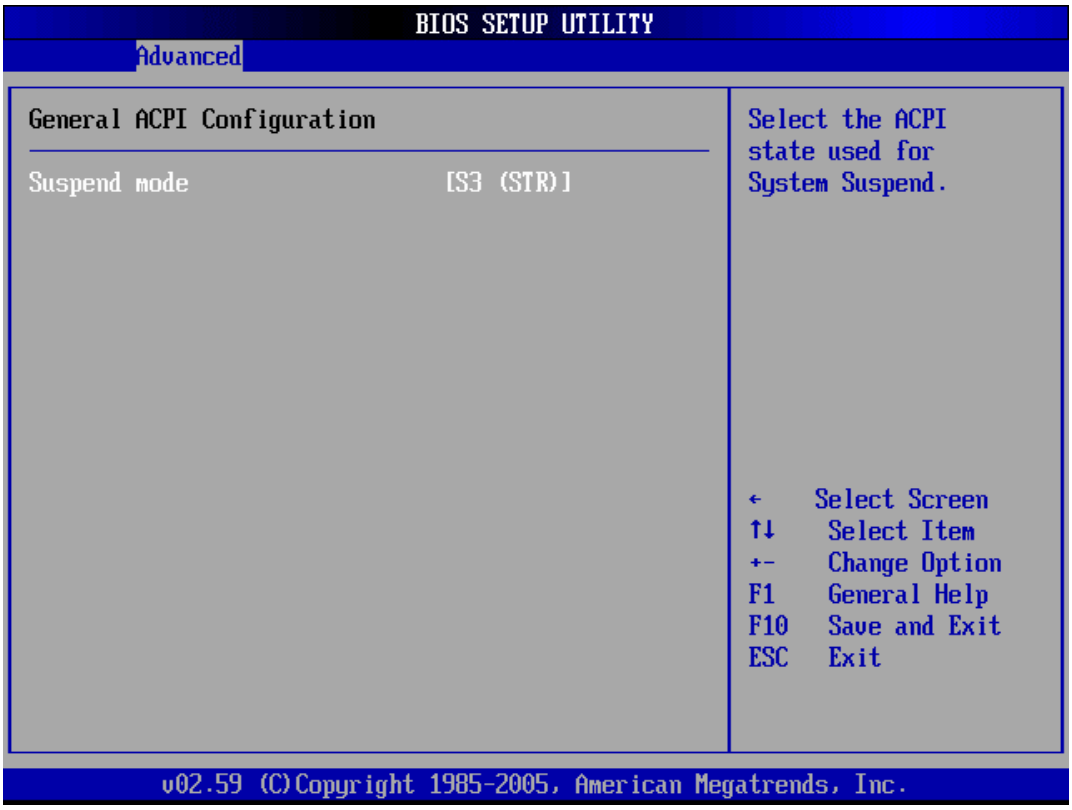
The **ACPI Configuration** menu (**BIOS Menu 8**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 8: ACPI Configuration

6.3.5.1 General ACPI Configuration

Use the **General ACPI Configuration** menu (**BIOS Menu 9**) to select the ACPI state when the system is suspended.



BIOS Menu 9: General ACPI Configuration [Advanced\ ACPI Configuration]

➔ **Suspend Mode [S3 (STR)]**

Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

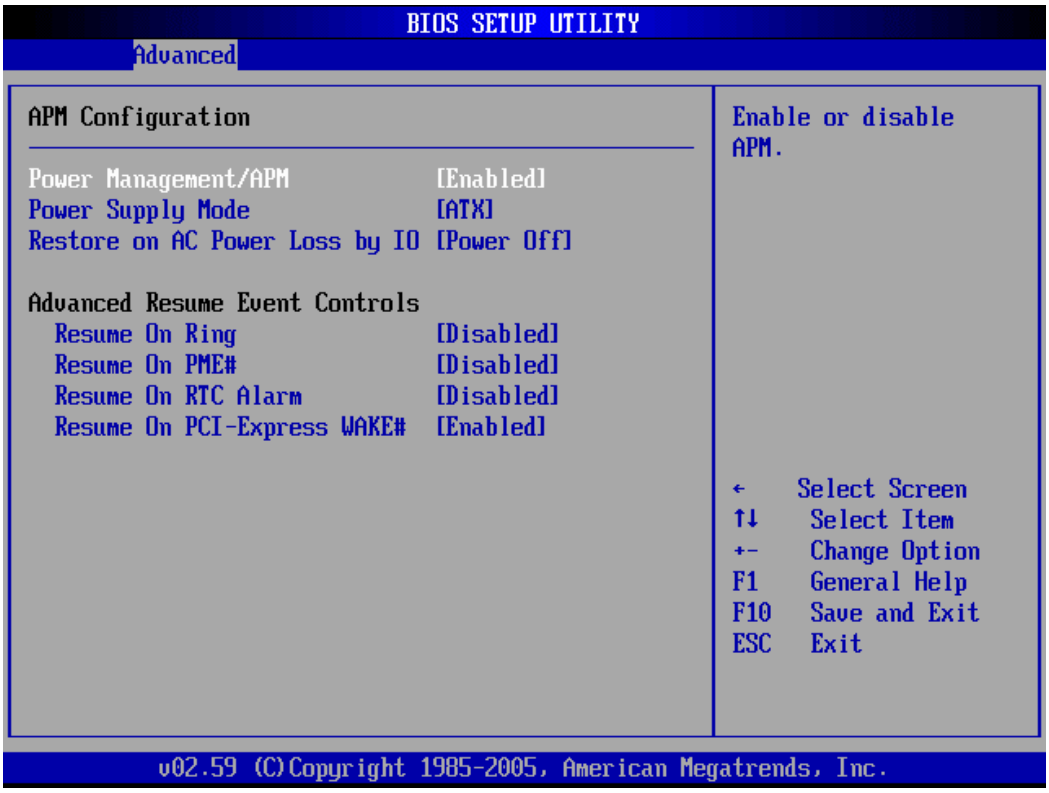
➔ **S1 (POS)** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** **DEFAULT** The system enters a S3(STR) sleep state. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

➔ **Auto** The BIOS automatically selects a sleep state for the system.

6.3.6 APM Configuration

The **APM Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.



BIOS Menu 10:Advanced Power Management Configuration

➔ **Power Management/APM [Enabled]**

Use the **Power Management/APM** BIOS option to enable access to the advanced power management features. If this option is disabled, the only other option on the screen is the **Power Button Mode**.

➔ **Disabled** Disables the Advanced Power Management (APM) feature

➔ **Enabled** **DEFAULT** Enables the APM feature

➔ **Power Supply Mode [ATX]**

Use the **Power Supply Mode** BIOS option to to select the power supply that is connected to the system.

➔ **AT**		An AT power supply is connected to the system
➔ **ATX**	**DEFAULT**	An ATX power supply is connected to the system

➔ **Restore on AC Power Loss by IO [Power Off]**

Use the **Restore on AC Power Loss by IO** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**	**DEFAULT**	The system remains turned off
➔ **Power On**		The system turns on
➔ **Last State**		The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled**	**DEFAULT**	Wake event not generated by an incoming call
➔ **Enabled**		Wake event generated by an incoming call

➔ **Resume on PME# [Disabled]**

Use the **Resume on PME#** BIOS option to enable activity on the PCI PME (power management event) controller to rouse the system from a suspend or standby state.

➔ **Disabled**	**DEFAULT**	Wake event not generated by PCI PME controller

activity

➔ **Enabled** Wake event generated by PCI PME controller activity

➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the following appears with values that can be selected:

- ➔ **RTC Alarm Date (Days)**
- ➔ **System Time**

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

➔ **Resume On PCI-Express WAKE# [Enabled]**

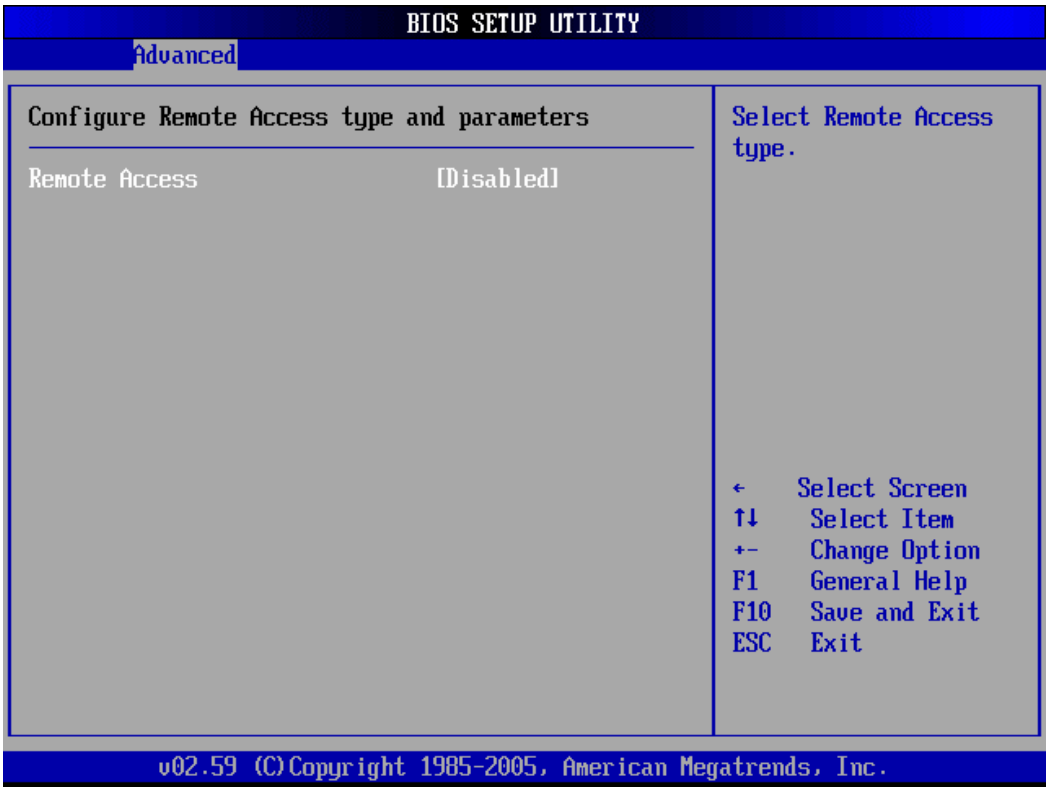
The **Resume On PCI-Express WAKE#** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the PCI express port.

➔ **Disabled** Wake event not generated by PCI express activity

➔ **Enabled** **DEFAULT** Wake event generated by PCI express activity

6.3.7 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 11**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 11: Remote Access Configuration [Advanced]

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below appear:

- ➔ **Serial Port Number**
- ➔ **Serial Port Mode**
- ➔ **Flow Control**
- ➔ **Redirection after BIOS POST**

➔ **Terminal Type**

➔ **VT-UTF8 Combo Key Support**

➔ **Sredir Memory Display Delay**

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

➔ **COM1**	**DEFAULT**	System is remotely accessed through COM1
➔ **COM2**		System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Flow Control [None]**

Use the **Flow Control** option to report the flow control method for the console redirection application.

➔ **None**	**DEFAULT**	No control flow,
➔ **Hardware**		Hardware is set as the console redirection
➔ **Software**		Software is set as the console redirection

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**		The console is not redirected after POST
➔ **Boot Loader**		Redirection is active during POST and during Boot Loader
➔ **Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI

➔ **VT100** The target terminal type is VT100

➔ **VT-UTF8** The target terminal type is VT-UTF8

➔ **VT-UTF8 Combo Key Support [Disabled]**

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

➔ **Disabled** **DEFAULT** Disables the VT-UTF8 terminal keys

➔ **Enabled** Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

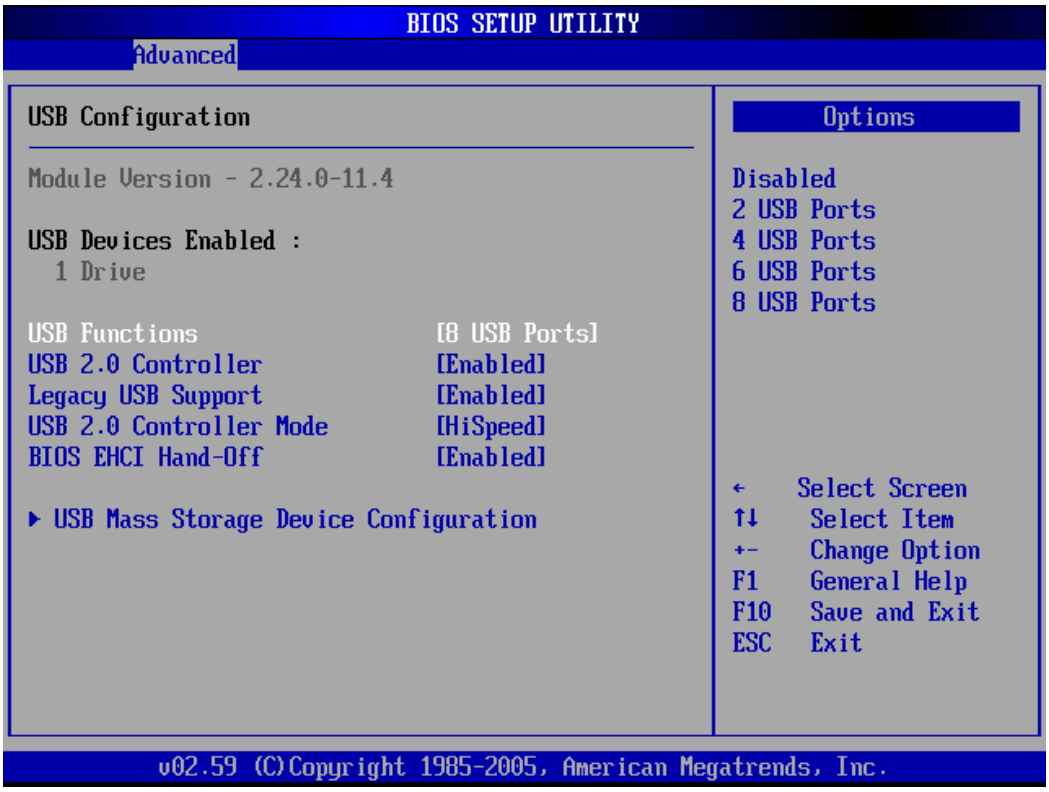
➔ **Sredir Memory Display Delay [Disabled]**

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay **DEFAULT**
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

6.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.



BIOS Menu 12: USB Configuration

➔ **USB Function [8 USB ports]**

Use the **USB Function** BIOS option to enable or disable a specified number of USB ports. If only two USB ports are being used, disabling the remaining six USB frees up system resources that can be redirected elsewehere.

➔ **Disabled**		USB function support disabled
➔ **2 USB Ports**		Two USB ports are enabled
➔ **4 USB Ports**		Four USB ports are enabled
➔ **6 USB Ports**		Six USB ports are enabled
➔ **8 USB Ports**	**DEFAULT**	Eight USB ports are enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled**		USB 2.0 controller disabled
➔ **Enabled**	**DEFAULT**	USB 2.0 controller enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed**		The controller is capable of operating at 12Mb/s
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at 480Mb/s

➔ **BIOS EHCI Handoff**

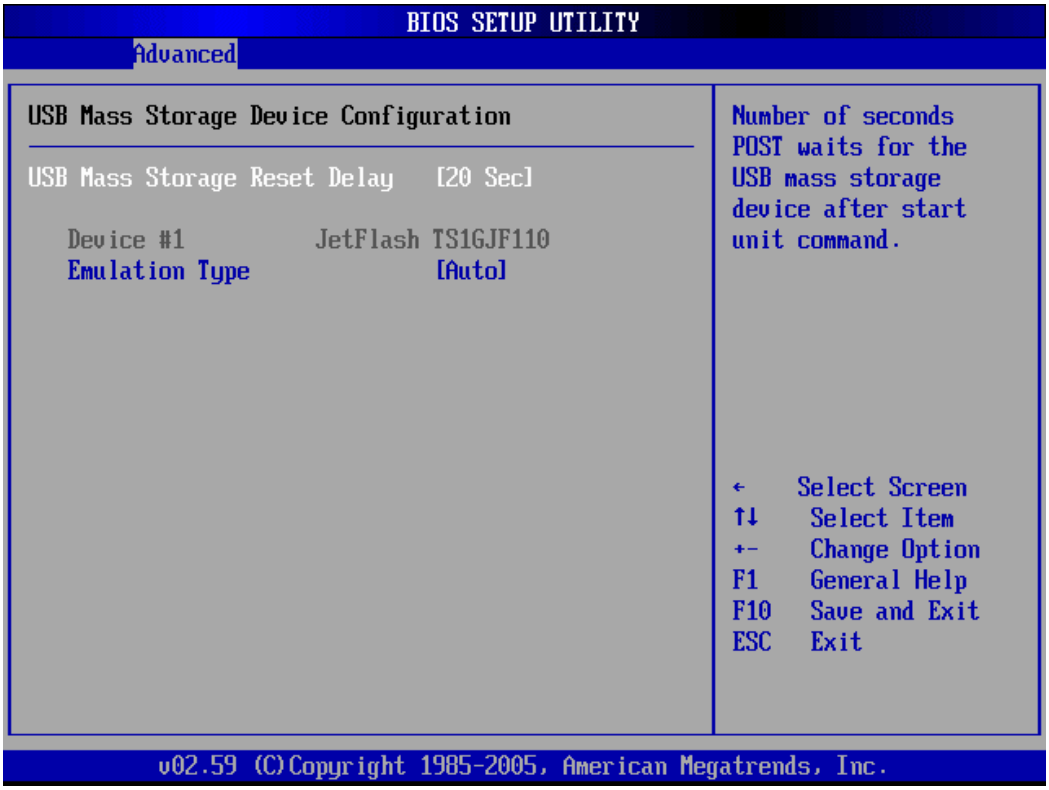
Use the **BIOS EHCI Handoff** option for systems running OSes that do not have EHCI hand-off support. The EHCI ownership change is managed by the EHCI driver.

➔ **Disabled** Systems with OSes that do not support EHCI can use the EHCI handoff functionality.

➔ **Enabled** **DEFAULT** Systems with OSes that do not support EHCI cannot use the EHCI handoff functionality.

6.3.8.1 USB Mass Storage Device Configuration

Use the **USB Mass Storage Device Configuration** menu (**?????**) to configure USB mass storage class devices.


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 JetFlash TS1GJF110
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 13: USB Mass Storage Device Configuration

➔ **USB Mass Storage Reset Delay [20 Sec]**

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

➔	**10 Sec**		POST waits 10 seconds for the USB mass storage device after the start unit command.
➔	**20 Sec**	**DEFAULT**	POST waits 20 seconds for the USB mass storage device after the start unit command.
➔	**30 Sec**		POST waits 30 seconds for the USB mass storage device after the start unit command.
➔	**40 Sec**		POST waits 40 seconds for the USB mass storage device after the start unit command.

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

➔ **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

NOTE:

Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.

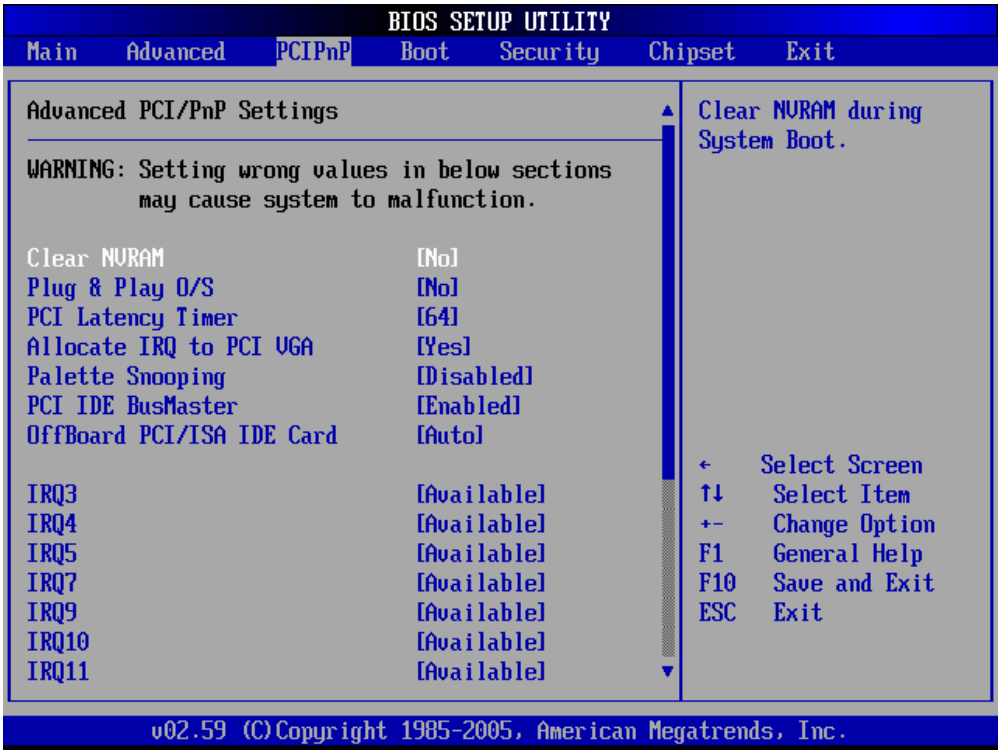
➔ **Auto**	**DEFAULT**	BIOS auto-detects the current USB.
➔ **Floppy**		The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.
➔ **Forced FDD**		Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.
➔ **Hard Disk**		Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.
➔ **CDROM**		Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

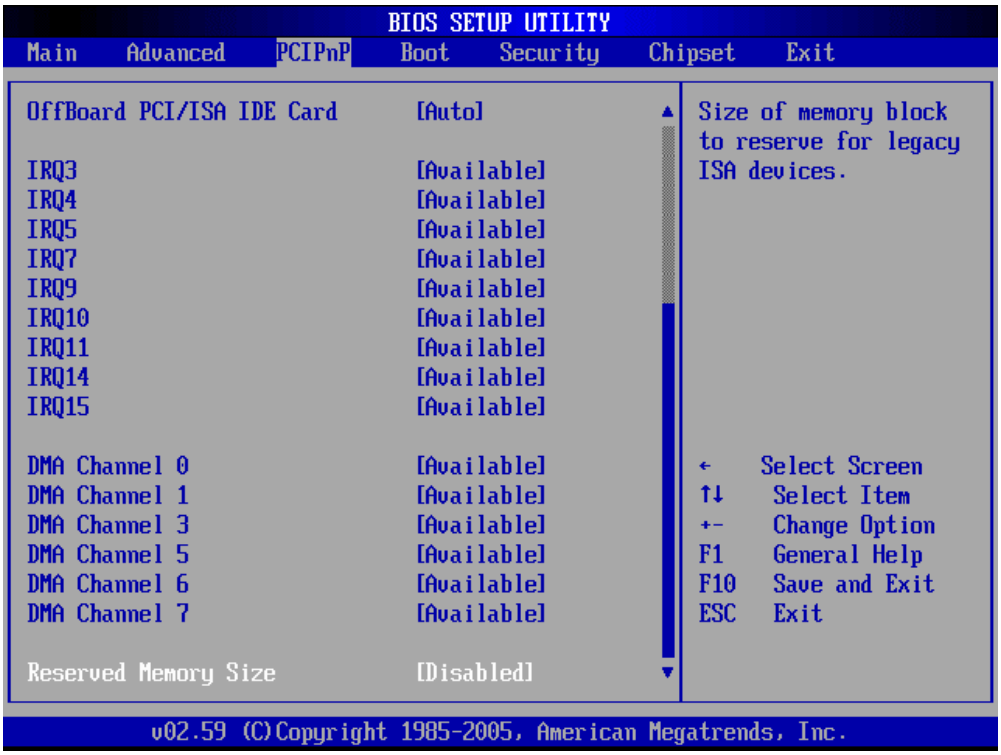
6.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 12**) to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.





BIOS Menu 14: PCI/PnP Configuration

➔ **Clear NVRAM [No]**

Use the **Clear NVRAM** option to specify if the NVRAM (Non-Volatile RAM) is cleared when the power is turned off.

➔ **No**	**DEFAULT**	System does not clear NVRAM during system boot
➔ **Yes**		System clears NVRAM during system boot

➔ **Plug & Play O/S [No]**

Use the **Plug & Play O/S** BIOS option to specify whether system plug and play devices are configured by the operating system or the BIOS.

➔ **No**	**DEFAULT**	If the operating system does not meet the Plug and Play specifications, this option allows the BIOS to configure all the devices in the system.
➔ **Yes**		This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

Use the **PCI Latency Timer** option to specify the PCI latency time. The latency time is measured in units of PCI clock cycles for the PCI device latency timer register. Configuration options are:

- 32
- 64 **DEFAULT**
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

Use the **Allocate IRQ to PCI VGA** option to restrict the system from giving the VGA adapter card an interrupt address.

➔ **Yes**	(Default)	Assigns an IRQ to a PCI VGA card if card requests IRQ
➔ **No**		Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

Use the **Palette Snooping** option to enable or disable the palette snooping function.

➔ **Disabled**	**DEFAULT**	Unless the VGA card manufacturer requires palette snooping to be enabled, this option should be disabled.
➔ **No/ Enabled**		PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Enabled]**

Use the **PCI IDE BusMaster** BIOS option to enable or prevent PCI IDE busmastering.

➔ **Disabled**		Busmastering is prevented
➔ **No/Enabled**	**DEFAULT**	IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

Use the **OffBoard PCI/ISA IDE Card** BIOS option to select the **OffBoard PCI/ISA IDE Card**.

➔ **Auto**	**DEFAULT**	The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.
➔ **PCI Slot 1**		PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.
➔ **PCI Slot 2**		PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 2.
➔ **PCI Slot 3**		PCI Slot 3 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 3.
➔ **PCI Slot 4**		PCI Slot 4 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 4.
➔ **PCI Slot 5**		PCI Slot 5 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 5.
➔ **PCI Slot 6**		PCI Slot 6 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 6.

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6

- DM Channel 7

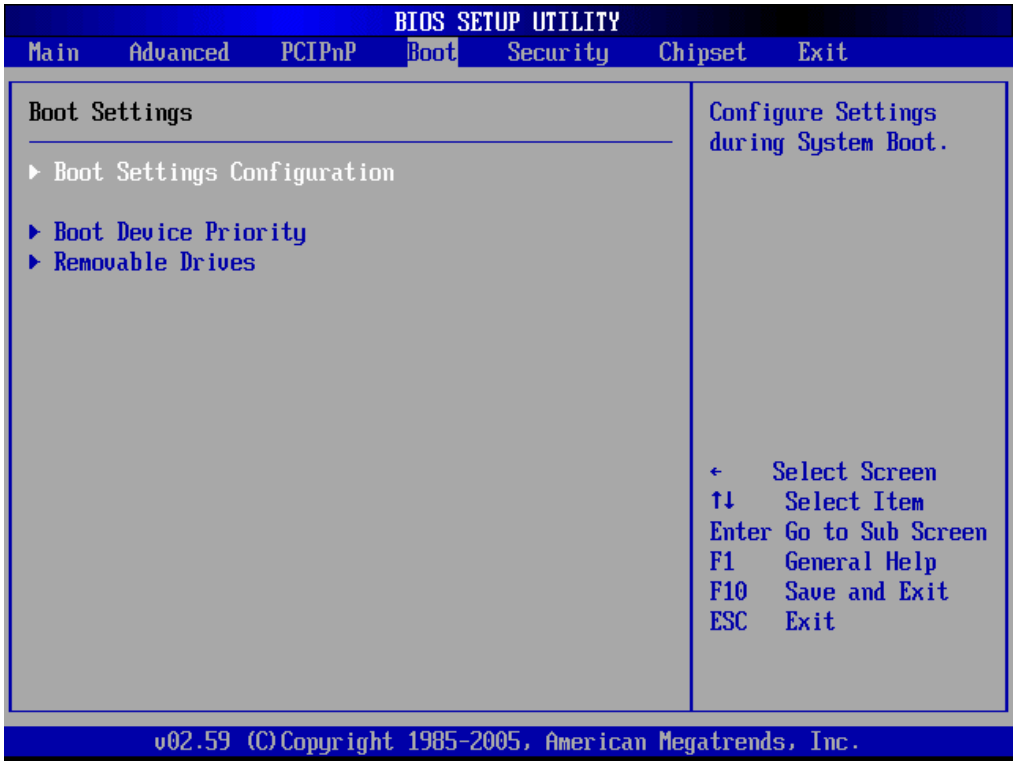
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16KB reserved for legacy ISA devices
➔	**32K**		32KB reserved for legacy ISA devices
➔	**64K**		54KB reserved for legacy ISA devices

6.5 Boot

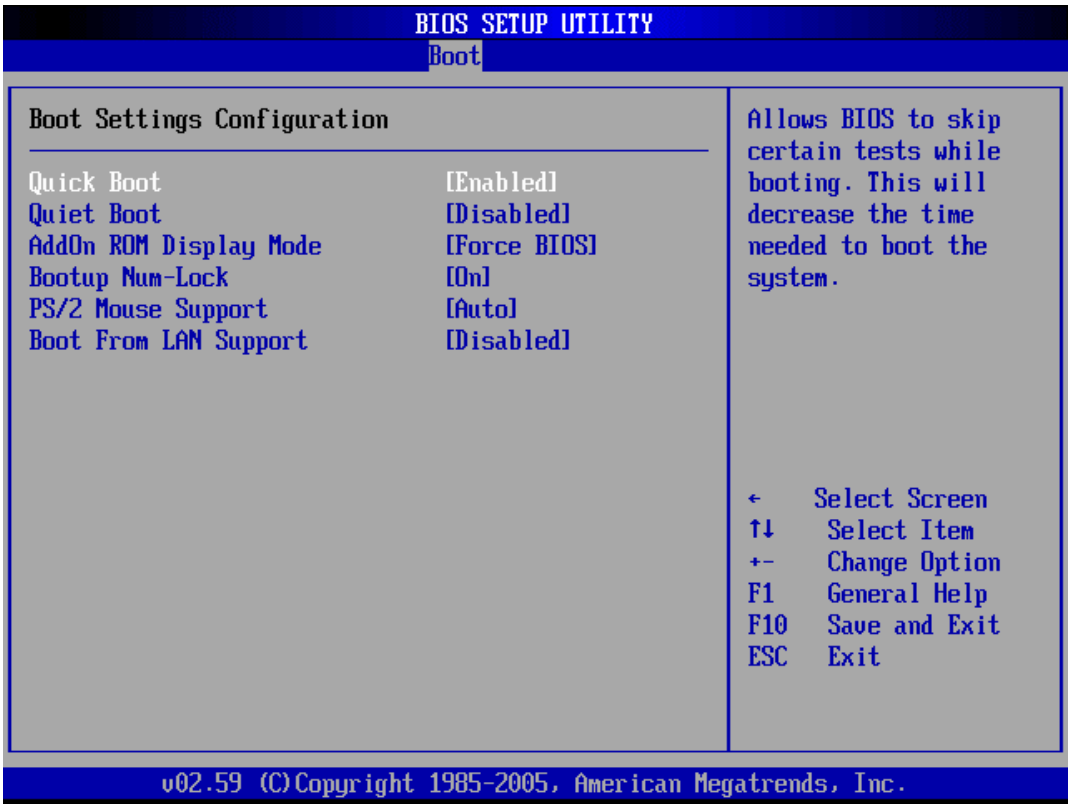
Use the **Boot** menu (**BIOS Menu 15**) to configure system boot options.



BIOS Menu 15: Boot

6.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 15**) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
PS/2 Mouse Support [Auto]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 16: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled** **DEFAULT** Normal POST messages displayed

➔ **Enabled** OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS** **DEFAULT** The system forces third party BIOS to display during system boot.

➔ **Keep Current** The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **PS/2 Mouse Support [Auto]**

Use the **PS/2 Mouse Support** option adjusts PS/2 mouse support capabilities.

➔ **Disabled** PS/2 mouse support is disabled and prevented from using system resources.

➔ **Enabled** Allows the system to use a PS/2 mouse.

➔ **Auto** **DEFAULT** The system auto-adjusts PS/2 mouse support.

➔ **Boot From LAN Support [Disabled]**

Use the **Boot From LAN Support** option to enable the system to be booted from a remote system.

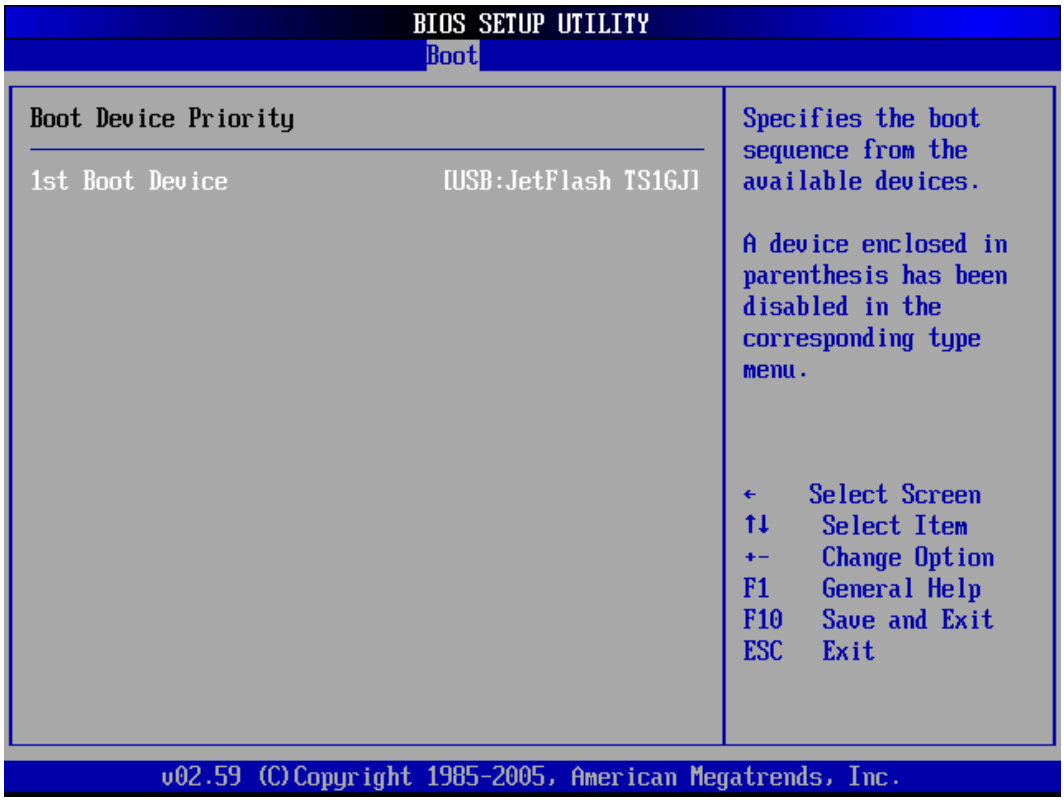
➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the LAN

➔ **Enabled** Can be booted from a remote system through the LAN

6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 17**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device
[USB:JetFlash TS1GJ]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 17: Boot Device Priority Settings

6.5.3 Removable Drives

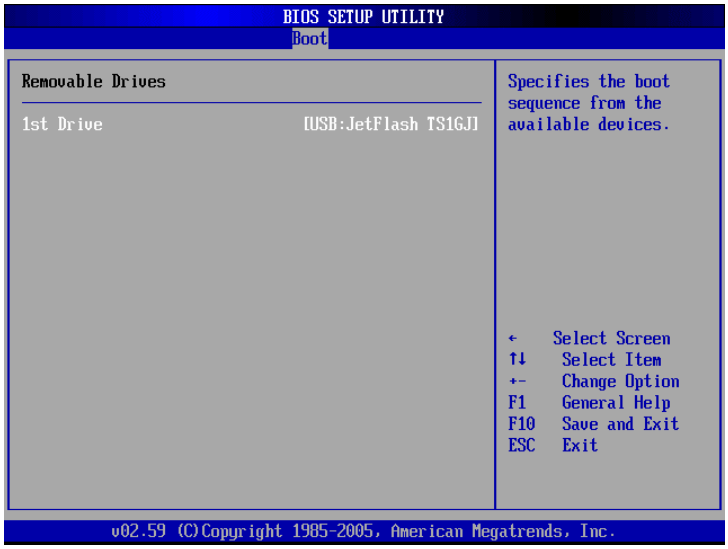
Use the **Removable Drives** menu (**BIOS Menu 18**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive [1st FLOPPY DRIVE]
- 2nd Drive [2nd FLOPPY DRIVE]

NOTE:

Only the drives connected to the system are shown. For example, if only one FDD is connected only "**1st Drive**" is listed.

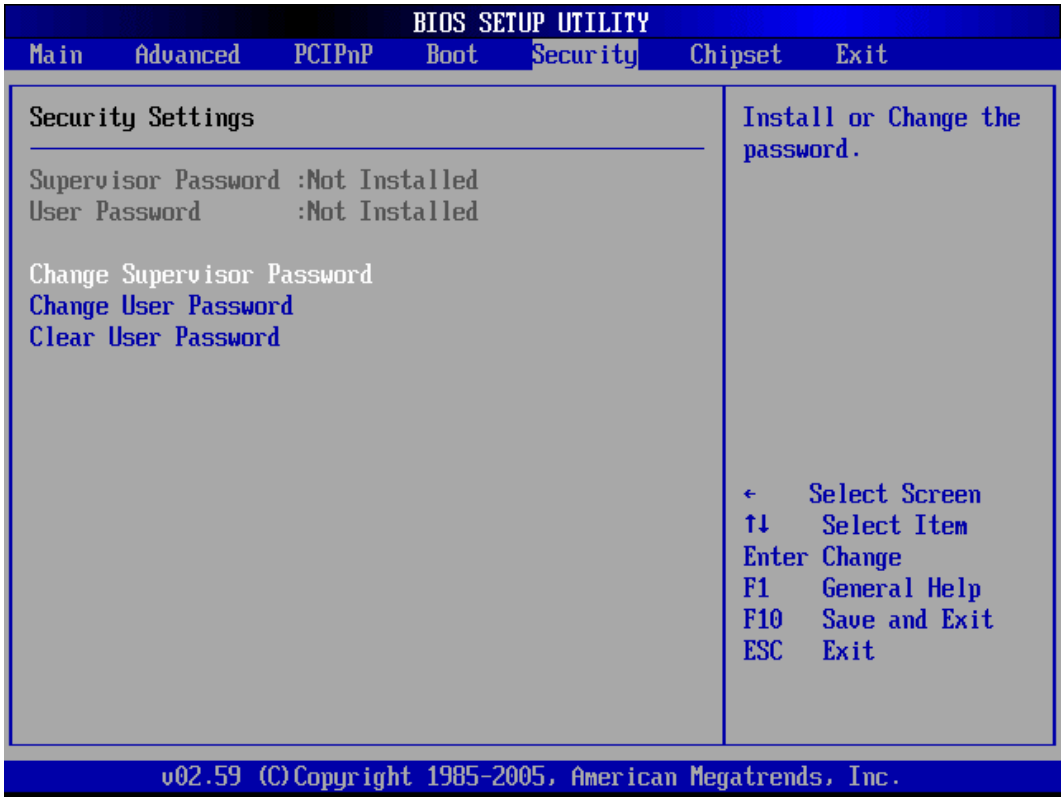
The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 18: Removable Drives

6.6 Security

Use the **Security** menu (**BIOS Menu 19**) to set system and user passwords.



BIOS Menu 19: Security

➔ Change Supervisor Password

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ Change User Password

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the

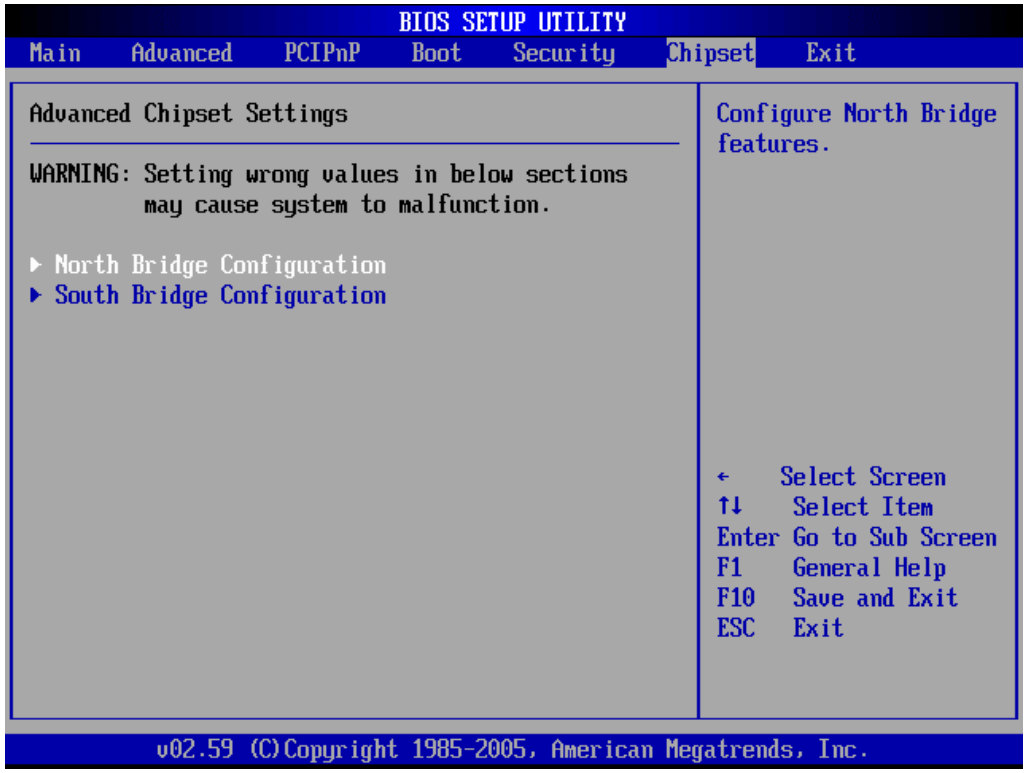
password. After the password has been added, **Install** appears next to **Change User Password**.

6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 20**) to access the NorthBridge and SouthBridge configuration menus.

WARNING:

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections
may cause system to malfunction.
North Bridge Configuration
South Bridge Configuration
Configure North Bridge features.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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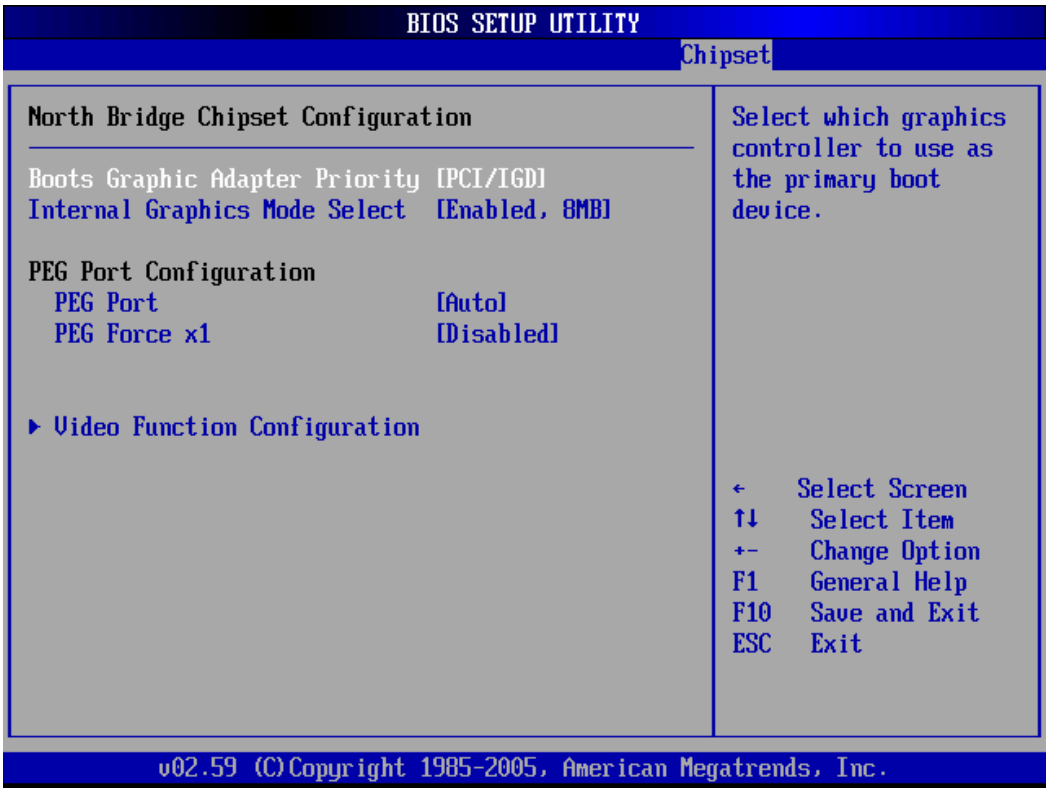
BIOS Menu 20: Chipset

6.7.1 NorthBridge Configuration

Use the **NorthBridge Configuration** menu (**BIOS Menu 20**) to configure the Northbridge chipset.



BIOS Menu 21:NorthBridge Chipset Configuration

➔ **Boots Graphics Adapter Priority [PCI/IGD]**

Use the **Boots Graphics Adapter Priority** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PEG/IGD
- PEG/PCI
- PCI/PEG

- PCI/IGD **DEFAULT**

➔ **Internal Graphics Mode Select [Enable, 8MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **Enable, 1MB**		1MB of memory used by internal graphics device
➔ **Enable, 8MB**	**DEFAULT**	8MB of memory used by internal graphics device

➔ **PEG Port [Auto]**

Use the **PEG Port** option to enable or disable the PCI Express port.

➔ **Auto**	**DEFAULT**	The system automatically detects the PEG port.
➔ **Disabled**		Installed PEG cards cannot function.

➔ **PEG Force X1 [Disabled]**

Use the **PEG Force x1** option to convert a PCI express X16 slot into a PCI express X1 slot.

➔ **Disabled**	**DEFAULT**	PCI express X16 slot runs in normal mode
➔ **Enabled**		PCI express X16 slot runs in PCI express X1 mode

6.7.1.1 Video Function Configuration

Use the **Video Function Configuration** menu to configure the video device connected to the system.

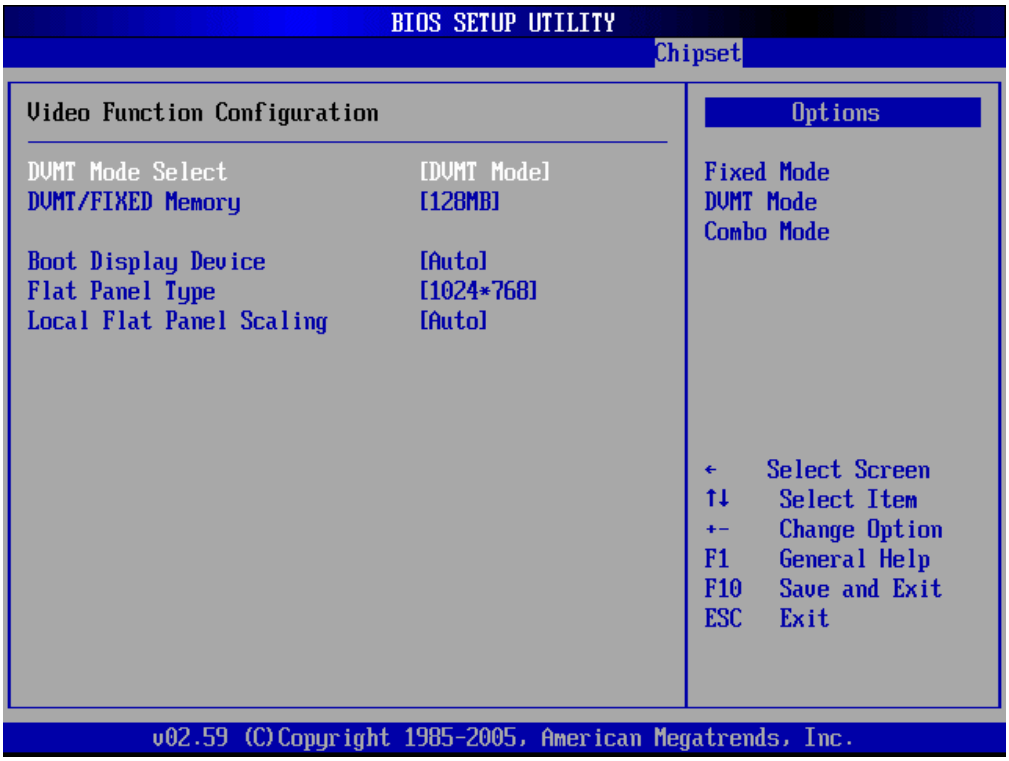


Figure 6-1: Video Function Configuration

➔ **DVMT Mode Select [DVMT Mode]**

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

➔ **Fixed Mode**		A fixed portion of graphics memory is reserved as graphics memory.
➔ **DVMT Mode**	**DEFAULT**	Graphics memory is dynamically allocated according to the system and graphics needs.
➔ **Combo Mode**		A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed, graphics memory is dynamically allocated according to the system and graphics needs.

➔ **DVMT/FIXED Memory [128MB]**

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Selec**t option. If **Combo Mode** is selected, the maximum amount of graphics memory is 128MB. Configuration options are listed below.

- 64MB
- 128MB **DEFAULT**
- Maximum DVMT

➔ **Boot Display Device [Auto]**

Use the **Boot Display Device** option to select the display device used by the system when it boots. Configuration options are listed below.

- Auto **DEFAULT**

➔ **Flat Panel Type [1024*768]**

Use the **Flat Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- 640x480
- 800x600
- 1024x768
- 1280x1024 (36bits)
- 1400x1050 (36bits)
- 1600x1200 (36bits)
- 1280x768
- 1680x1050 (36bits)
- 1920x1200 (36bits)
- 1024x768 (48bits)
- 1400x900 (36bits)
- 1440x900 (48bits)
- 1280x800

- 1280x600
- 2048x1536 (36bits)

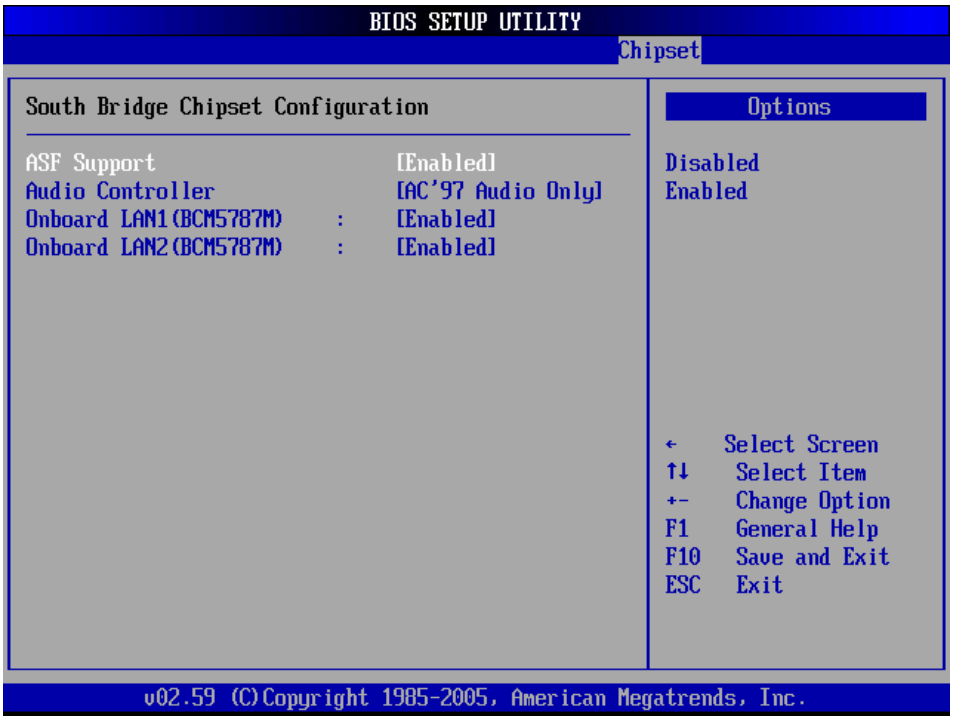
➔ **Local Flat Panel Scaling [Auto]**

Use the **Local Flat Panel Scaling** option to select the method of scaling for the flat panel screen attached to the system.

➔	**Auto**	**DEFAULT**	Scaling is automatic
➔	**Forced Scaling**		Scaling is forced
➔	**Disabled**		Scaling is disabled

6.7.2 SouthBridge Chipset Configuration

The **SouthBridge Chipset Configuration** menu (**BIOS Menu 22**) the Southbridge chipset to be configured.



BIOS Menu 22:SouthBridge Chipset Configuration

➔ **ASF Support [Enabled]**

Use the **ASF Support** BIOS option to control the system's ability to connect to a remote management server.

➔ **Disabled**		The system will not communicate with a remote management server.
➔ **Enabled**	**DEFAULT**	The Alert Standard Format (ASF) controller is activated and can communicate with a remote management server.

➔ **Audio Controller [AC`97 Audio Only]**

The **Audio Controller** option allows selection of the audio controller to use.

➔ **AC`97 Audio Only**	The on-board AC'97 controller is enabled
➔ **Disabled**	All audio controllers are disabled

➔ **OnBoard LAN1 (BCM5787M) [Enabled]**

The **OnBoard LAN1 (BCM5787M)** option enables or disables the on-board LAN1.

➔ **Auto**		The on-board LAN1 controller is automatically detected and enabled
➔ **Enabled**	**DEFAULT**	The on-board LAN1 controller is manually enabled
➔ **Disabled**		The on-board LAN1 controller is manually disabled

➔ **On-board LAN2(BCM5787M) [Enabled]**

The **On-board LAN2(BCM5787M)** option enables or disables the on-board LAN2.

➔ **Auto**	The on-board LAN2 controller is automatically detected

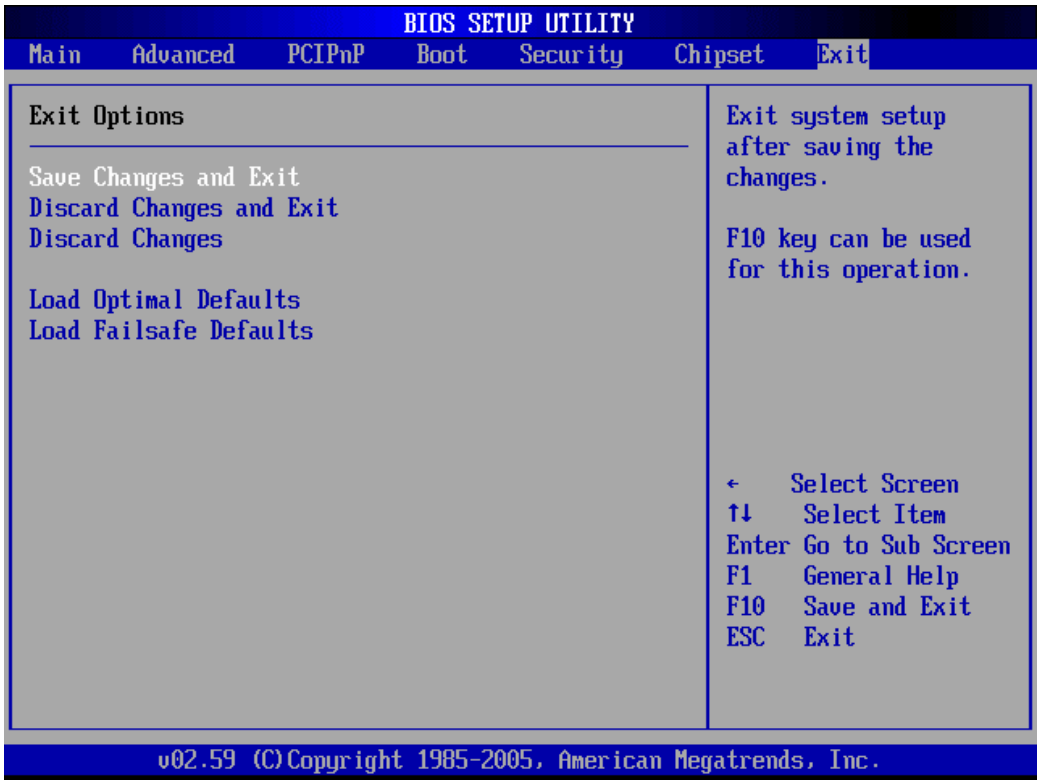
and enabled

➔ **Enabled** **DEFAULT** The on-board LAN2 controller is manually enabled

➔ **Disabled** The on-board LAN2 controller is manually disabled

6.8 Exit

Use the **Exit** menu (**BIOS Menu 23**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

BIOS Menu 23:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the Load Failsafe Defaults option to load failsafe default values for each of the parameters on the Setup menus. F8 key can be used for this operation.

Chapter

7

Driver Installation

7.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. You may visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system.

- Chipset driver
- VGA driver
- LAN driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the KINO-9453 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

Step 2: The starts up automatically

Step 3: Select KINO-9453 from the initial menu.

Step 4: A new screen with a list of available drivers appears (**Figure 7-1**).

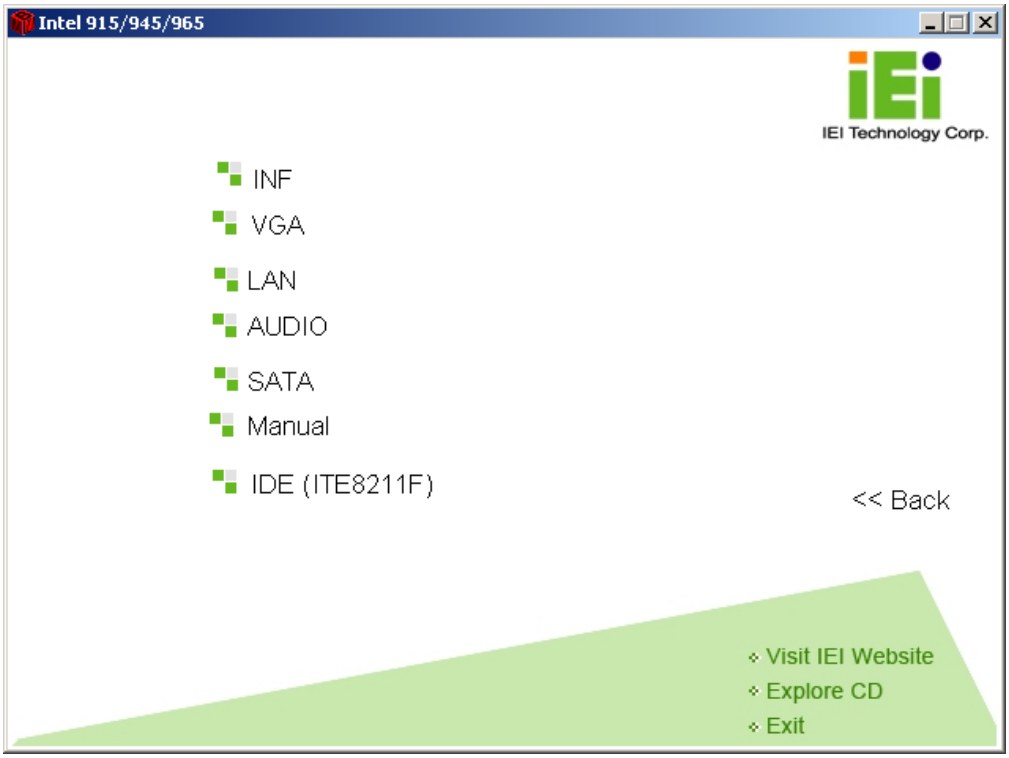


Figure 7-1: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-1**.

7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below:

Step 1: Select the INF driver from the list in **Figure 7-1**.

Step 2: A new window opens (**Figure 7-2**).

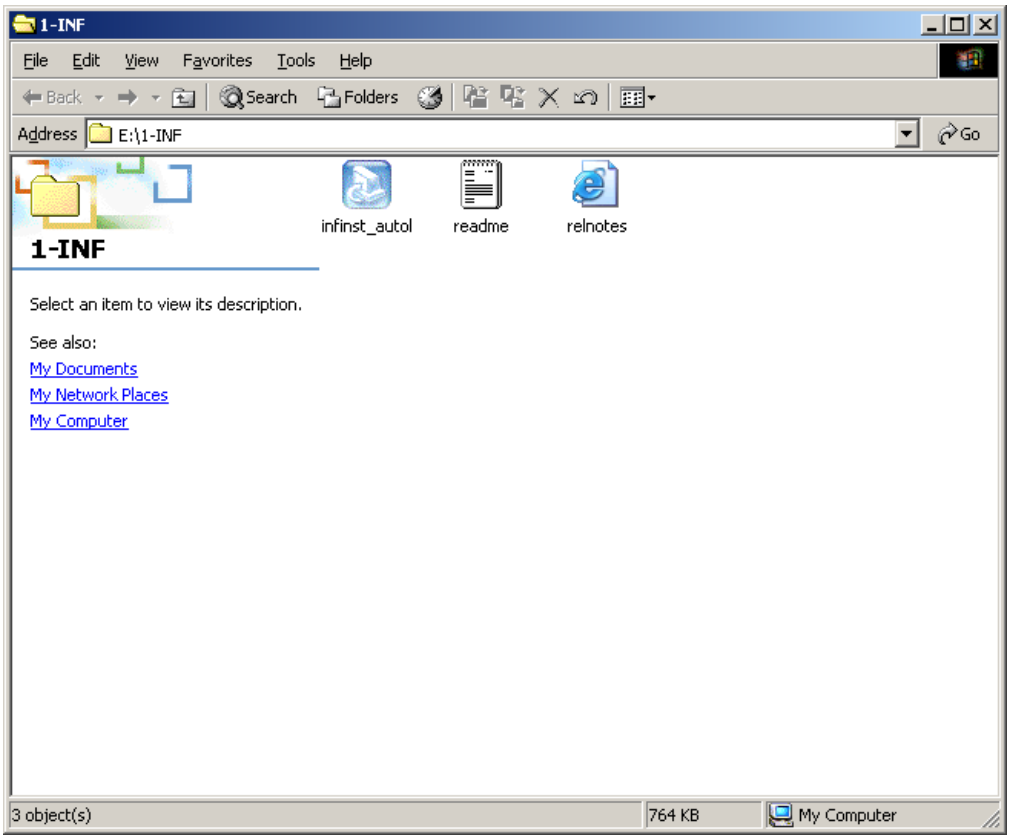


Figure 7-2: Chipset Driver Installation Program

Step 3: Double click the infinst_Autol icon in **Figure 7-2**.

Step 4: The welcome screen in **Figure 7-3** appears.

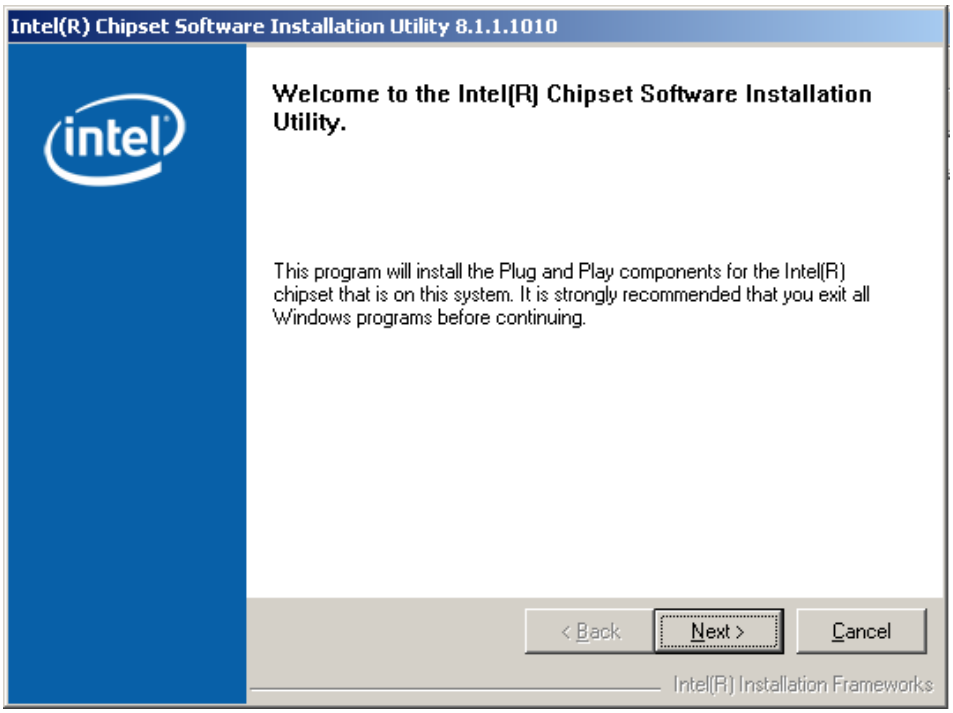

Intel(R) Chipset Software Installation Utility 8.1.1.1010
Welcome to the Intel(R) Chipset Software Installation Utility.
This program will install the Plug and Play components for the Intel(R) chipset that is on this system. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-3: Chipset Driver Installation Welcome Screen

Step 5: Click **NEXT** in **Figure 7-3** to continue the installation process.

Step 6: The license agreement in **Figure 7-4** appears.

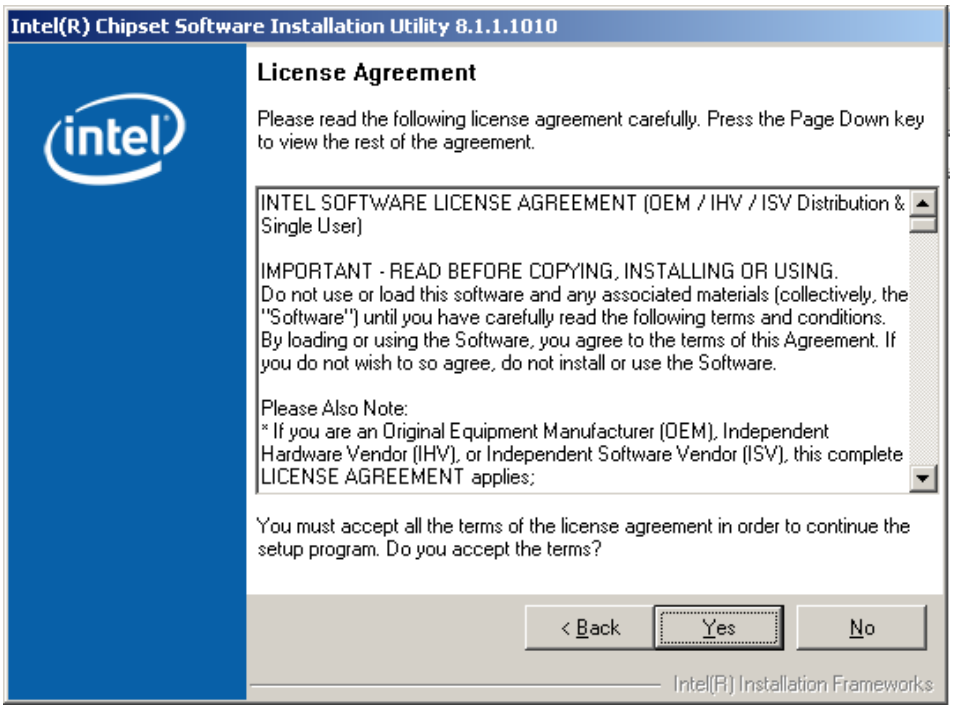

Intel(R) Chipset Software Installation Utility 8.1.1.1010
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-4: Chipset Driver Installation License Agreement

Step 7: Click **YES** to continue the setup.

Step 8: The Readme file in **Figure 7-5** appears.

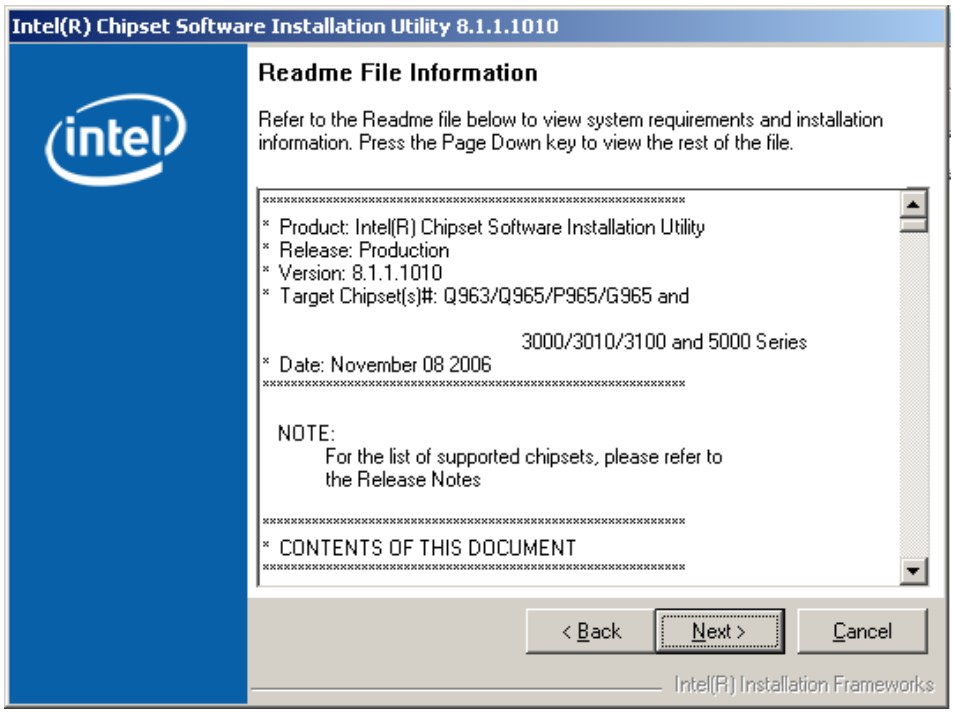

Intel(R) Chipset Software Installation Utility 8.1.1.1010
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Product: Intel(R) Chipset Software Installation Utility
* Release: Production
* Version: 8.1.1.1010
* Target Chipset(s)#: Q963/Q965/P965/G965 and
3000/3010/3100 and 5000 Series
* Date: November 08 2006
NOTE:
For the list of supported chipsets, please refer to the Release Notes
* CONTENTS OF THIS DOCUMENT
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-5: Chipset Driver Readme File Information

Step 9: Click **NEXT** in **Figure 7-5** to start the driver installation.

Step 10: After the driver installation process is complete, a confirmation screen (**Figure 7-6)** appears.

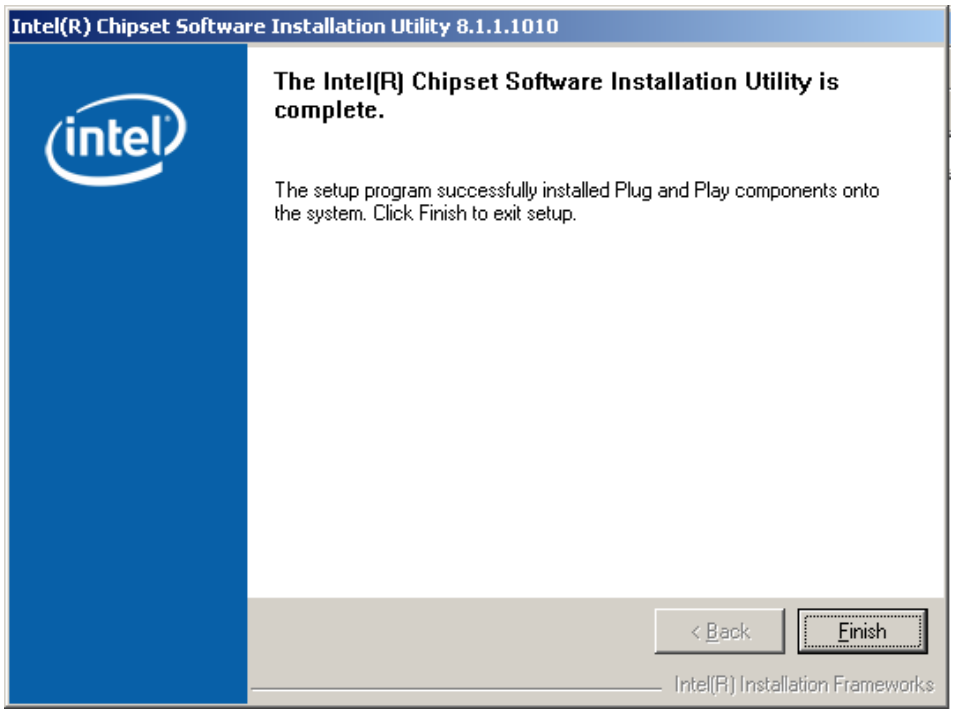

Intel(R) Chipset Software Installation Utility 8.1.1.1010
The Intel(R) Chipset Software Installation Utility is complete.
The setup program successfully installed Plug and Play components onto the system. Click Finish to exit setup.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-6: Chipset Driver Installation Complete

7.4 Intel Graphics Media Accelerator Driver

To install the chipset driver, please follow the steps below:

Step 1: Select the VGA driver from the list in **Figure 7-1**.

Step 2: A new window opens (**Figure 7-7**).

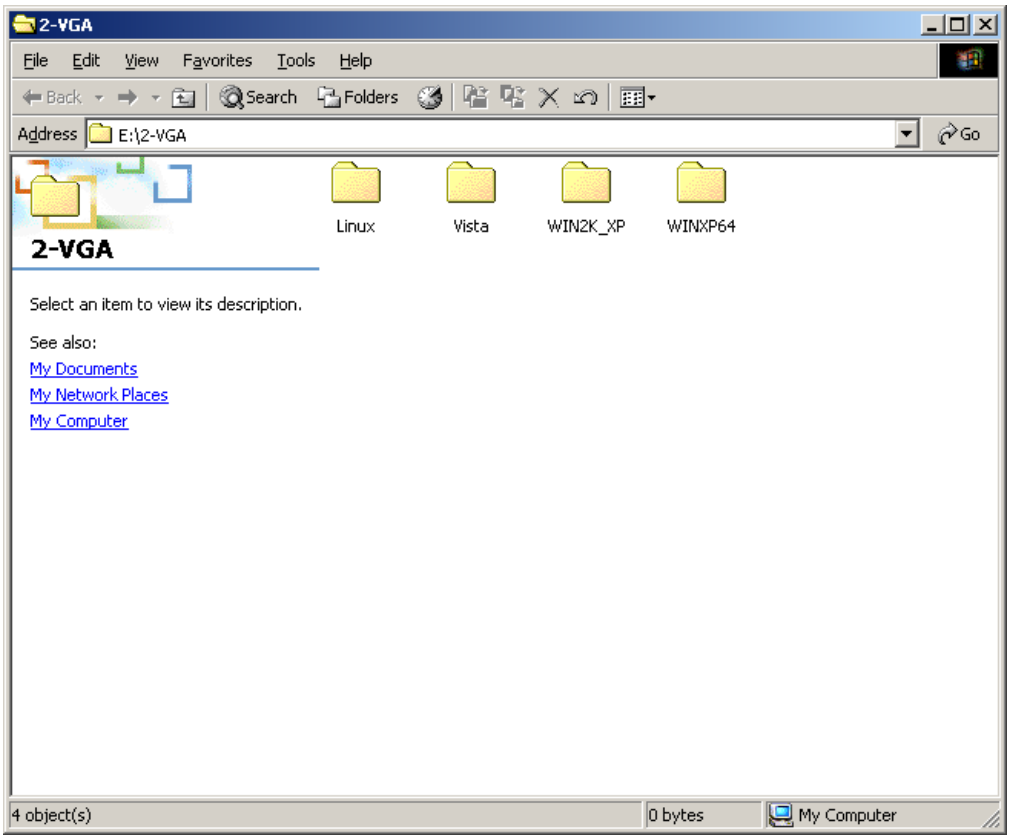


Figure 7-7: Select the Operating System

Step 3: Select the operating system from those shown in **Figure 7-7**.

Step 4: A new window appears (**Figure 7-8**).

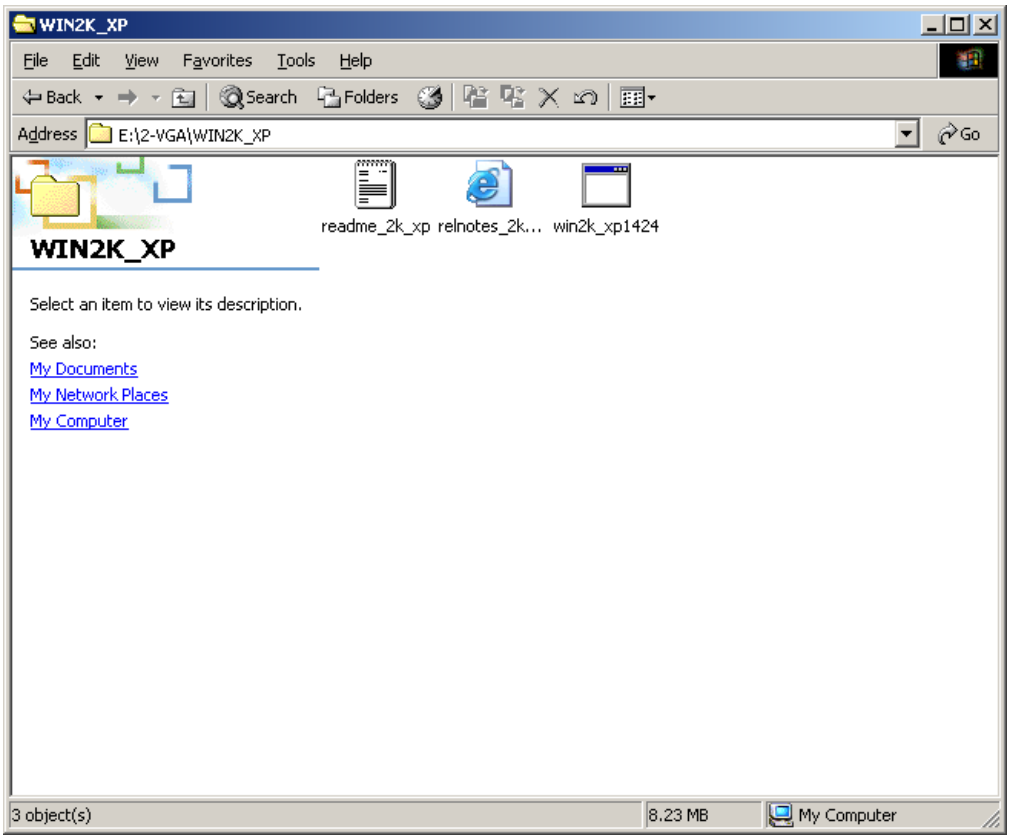


Figure 7-8: VGA Driver

Step 5: Click the installation program icon in **Figure 7-8**.

Step 6: The Readme information file shown in **Figure 7-9** appears.

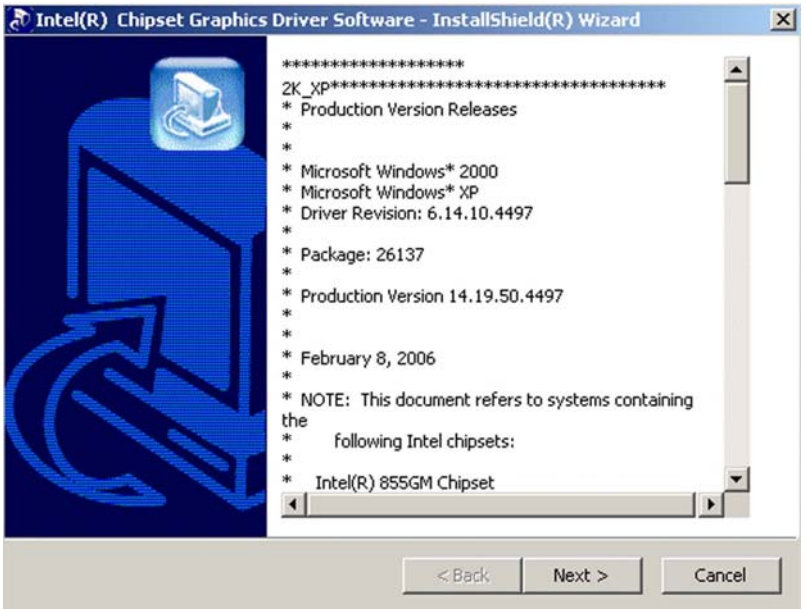


Figure 7-9: GMA Driver Readme File

Step 7: Click **NEXT** to extract the GMA driver files. See **Figure 7-10**.

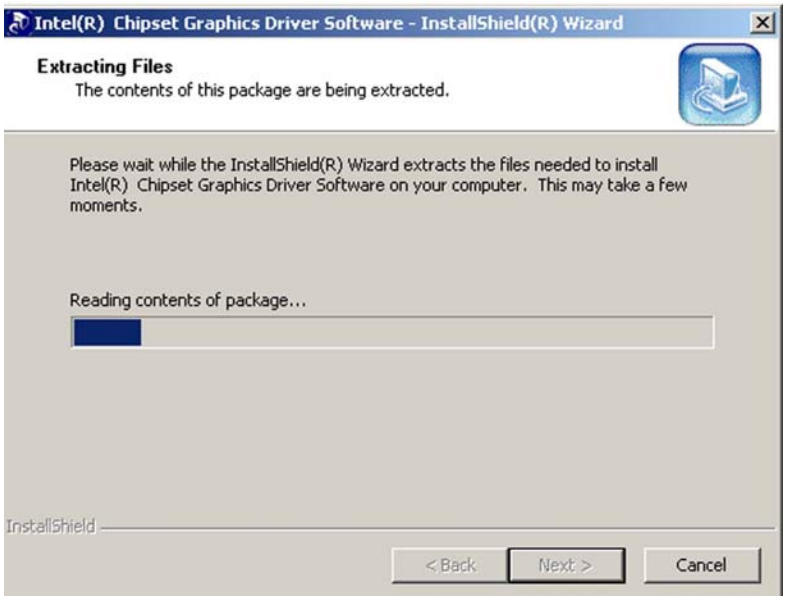

Intel(R) Chipset Graphics Driver Software - InstallShield(R) Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield(R) Wizard extracts the files needed to install Intel(R) Chipset Graphics Driver Software on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 7-10: GMA Driver File Extraction

Step 8: The welcome screen shown in **Figure 7-11** appears.

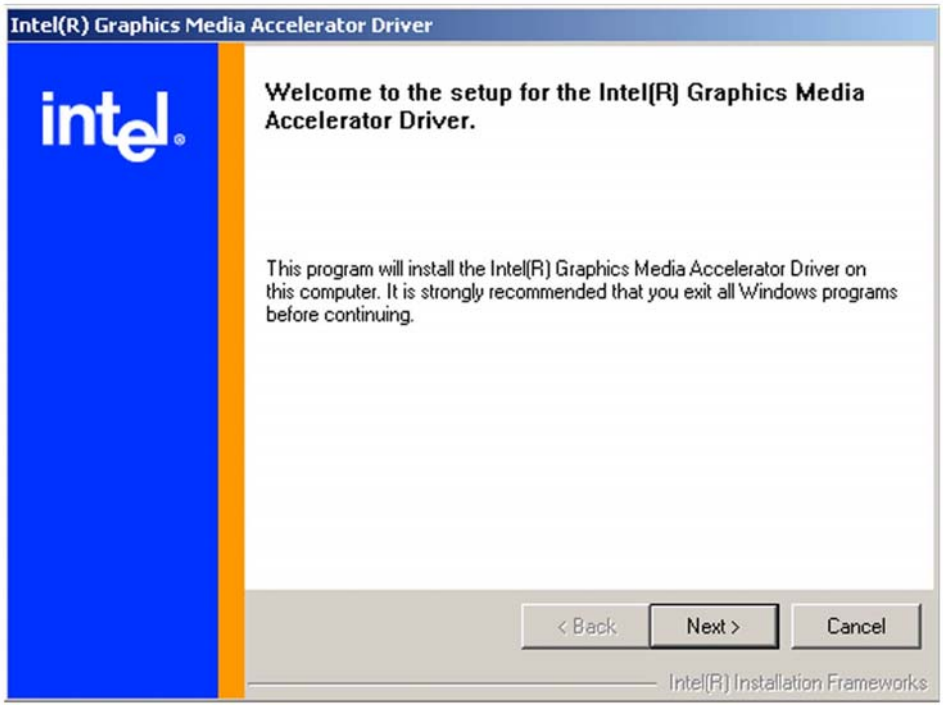

Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-11: GMA Driver Installation Welcome Screen

Step 9: To continue the installation process, click **NEXT**.

Step 10: The license agreement in **Figure 7-12** appears.

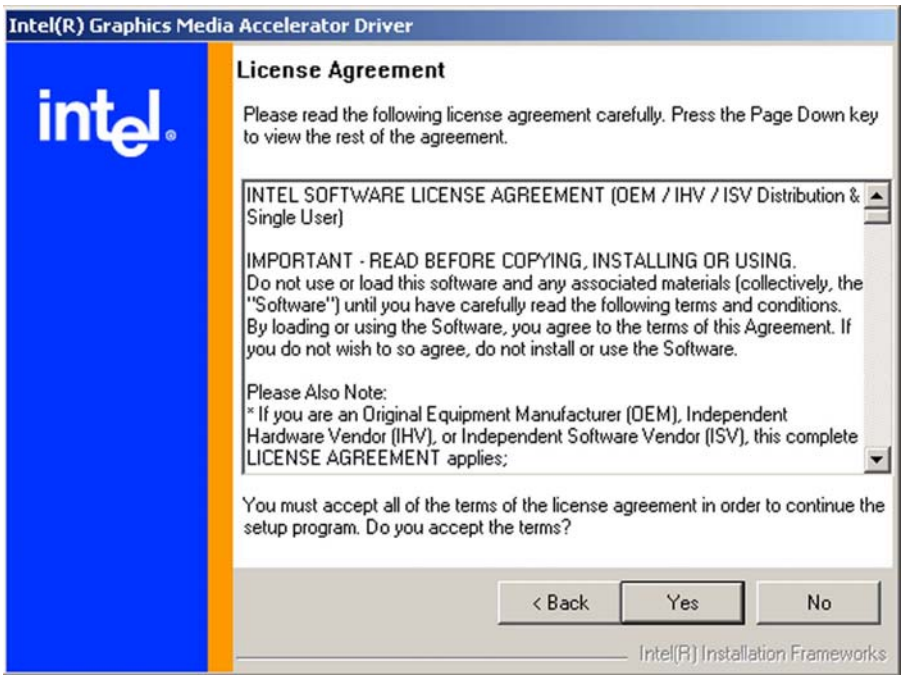

Intel(R) Graphics Media Accelerator Driver
intel
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-12: GMA Driver License Agreement

Step 11: Click the **YES** in **Figure 7-12** to continue.

Step 12: The installation notice shown in **Figure 7-13** appears.

Figure 7-13: GMA Driver Installing Notice

Step 13: A confirmation screen shown in **Figure 7-14** appears.

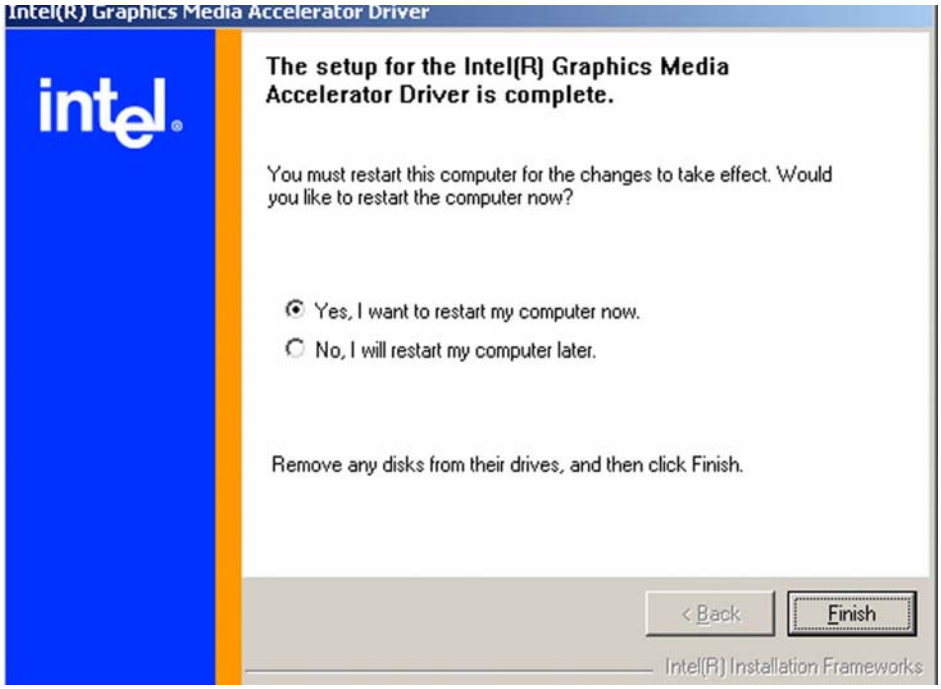

Intel(R) Graphics Media Accelerator Driver
intel
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-14: GMA Driver Installation Complete

Step 14: After selecting when to restart the computer in **Figure 7-14**, click **FINISH**.

7.5 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

Step 1: Open **Windows Control Panel (Figure 7-15)**.

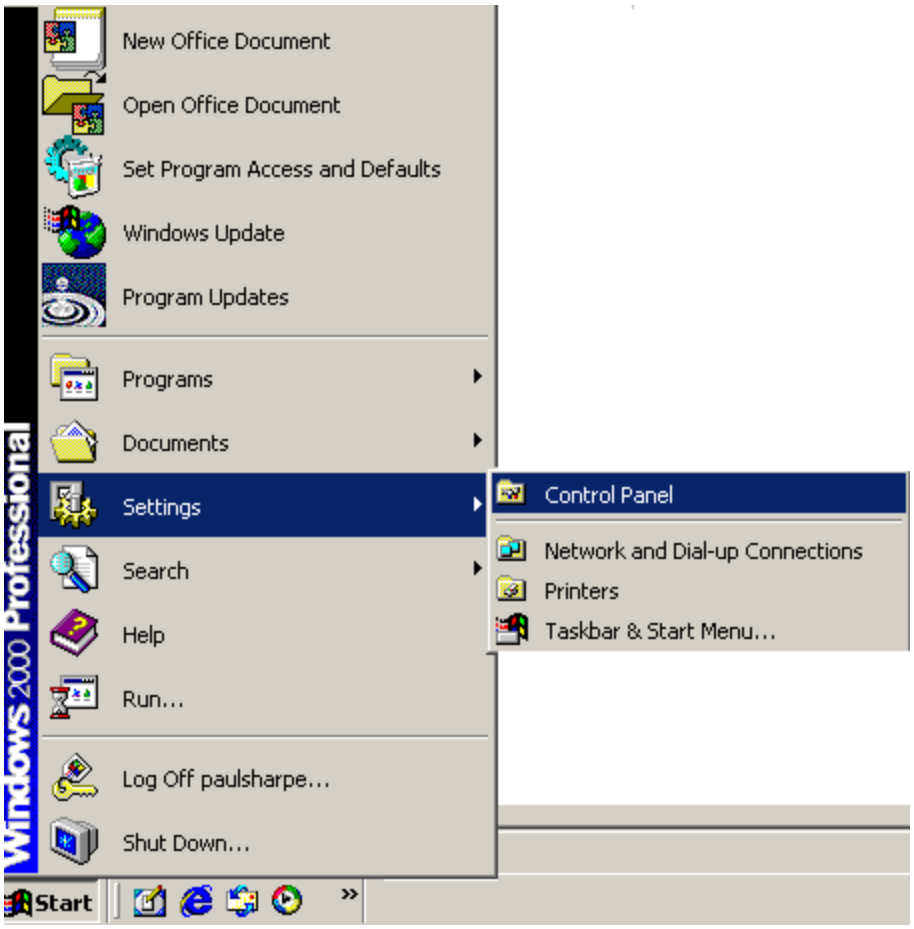


Figure 7-15: Access Windows Control Panel

Step 2: Double click the **System** icon (**Figure 7-16**).

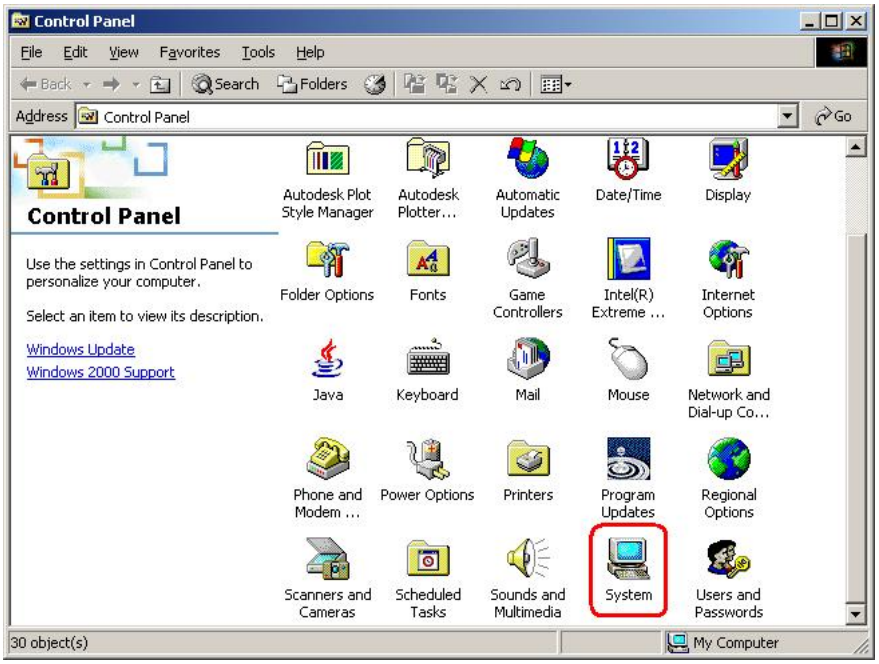


Figure 7-16: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (**Figure 7-17**).

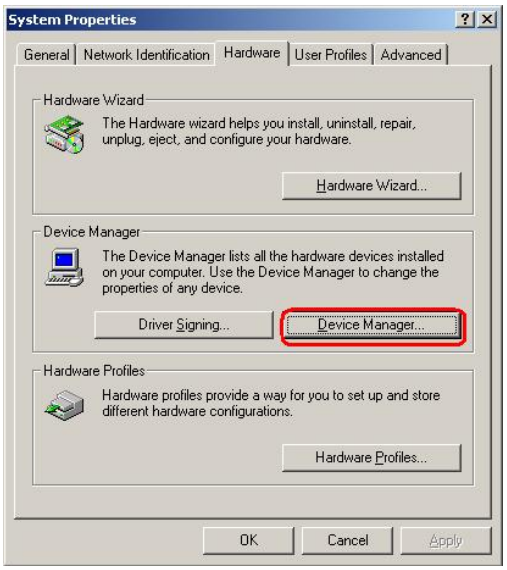

System Properties
General Network Identification Hardware User Profiles Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

Figure 7-17: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 7-18**).

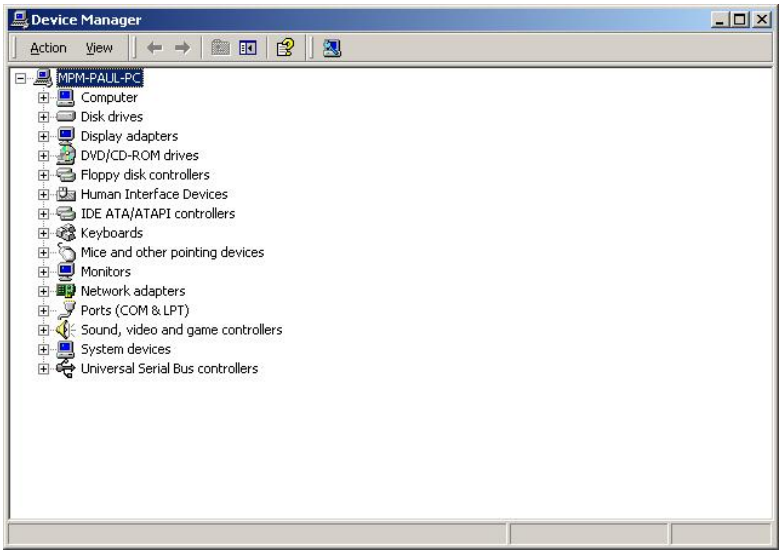


Figure 7-18: Device Manager List

Step 5: Double click the listed device that has question marks next to it. (This means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 7-19**). Click **NEXT** to continue.

Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
532DD36TA0379HannStar U171
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

Figure 7-19: Search for Suitable Driver

Step 7: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 7-20**).

Click **NEXT** to continue.

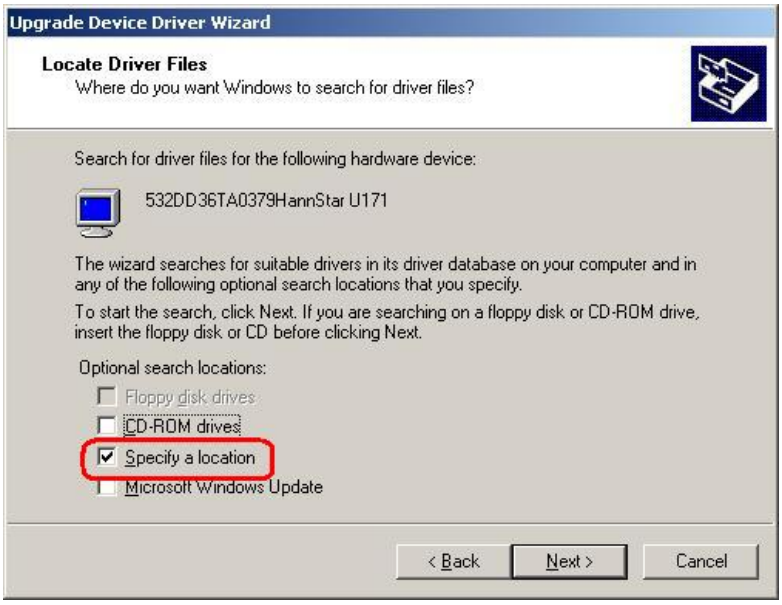

Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
532DD36TA0379HannStar U171
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

Figure 7-20: Locate Driver Files

Step 8: Select the proper OS folder under the "**X:\3-LAN\BROADCOM BCM57xx Drivers**" directory (**Figure 7-21**) in the location browsing window, where "**X:\"** is the system CD drive.

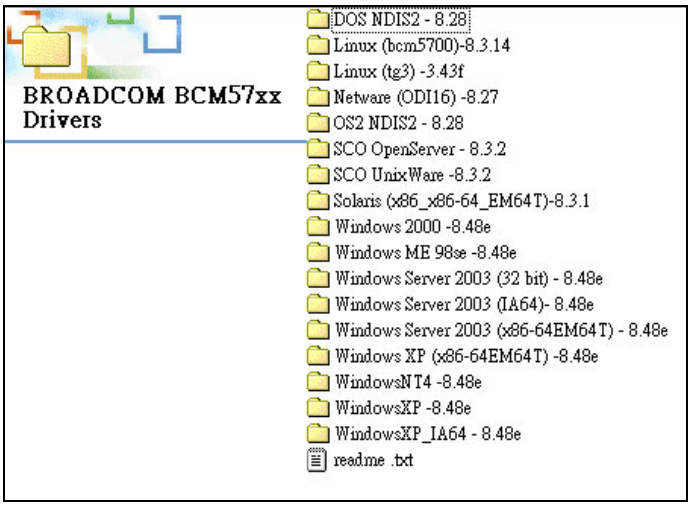


Figure 7-21: Location Browsing Window

Step 9: Click **OK** to continue. A driver files location menu window appears. Click **NEXT** to continue. The driver is installed.

7.6 Realtek HD Audio Driver (ALC883) Installation

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

7.6.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [Azalia]. See **Chapter 6** for details.

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.6.2 Driver Installation

Step 1: Insert the CD that came with the package.

Step 2: From the main driver menu, navigate to **X:\4-AUDIO\AC-KIT883HD\Windows** (or other appropriate OS). **X:** represents the system CD drive. A new window appears showing the folder contents (**Figure 6-26**).

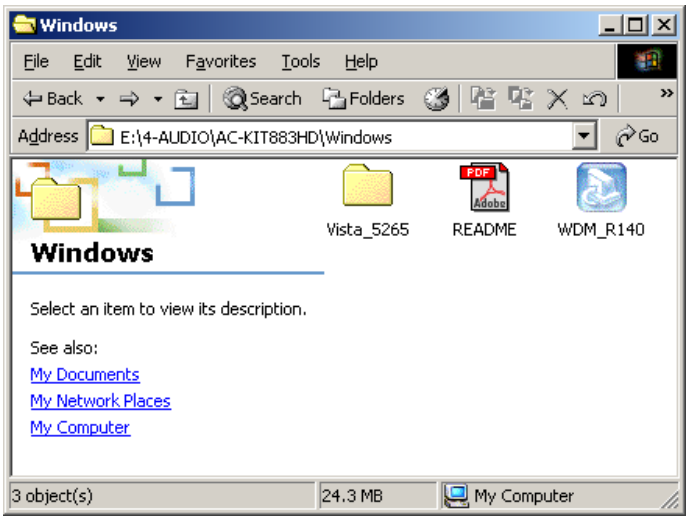


Figure 7-22: 4-AUDIO\AC-KIT883HD\Windows Folder

Step 3: Double-click the **WDM_R140** icon to begin the driver installation process.

Step 4: Once the **WDM_R140** icon is double clicked, the contents of the installation package are extracted. See **Figure 7-23.**

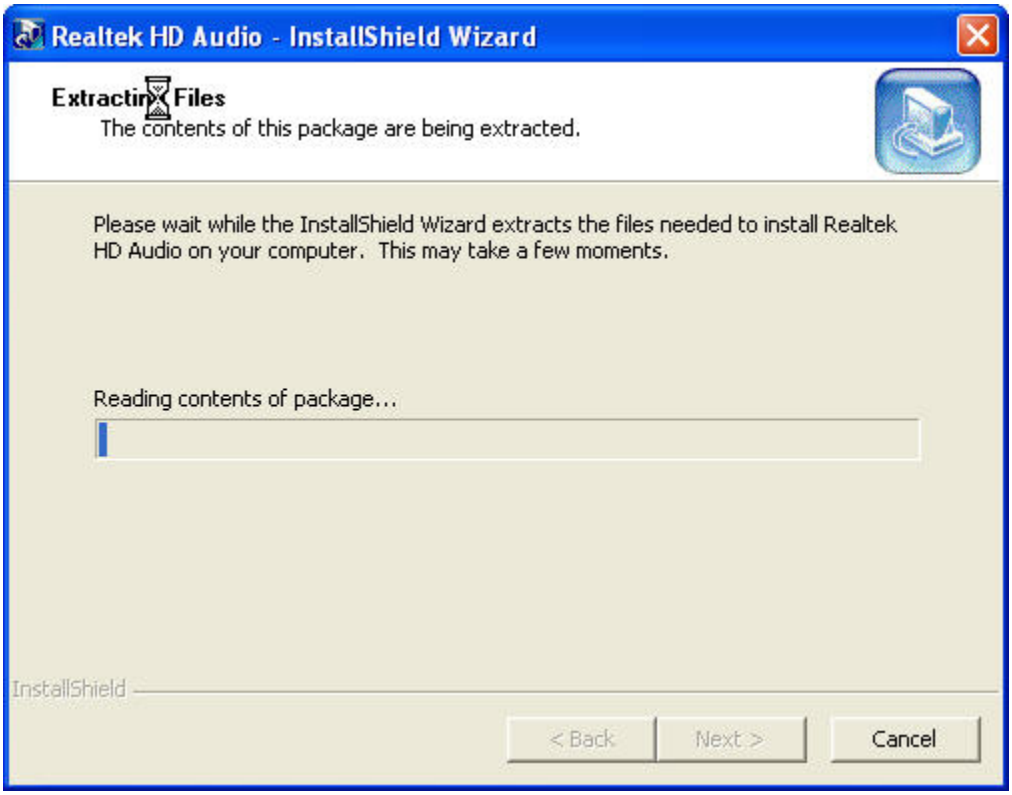

Realtek HD Audio - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install Realtek HD Audio on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 7-23: HD Audio Driver Setup Extracting Files

Step 5: The **Welcome** screen appears. Click **NEXT**. See **Figure 7-24**.

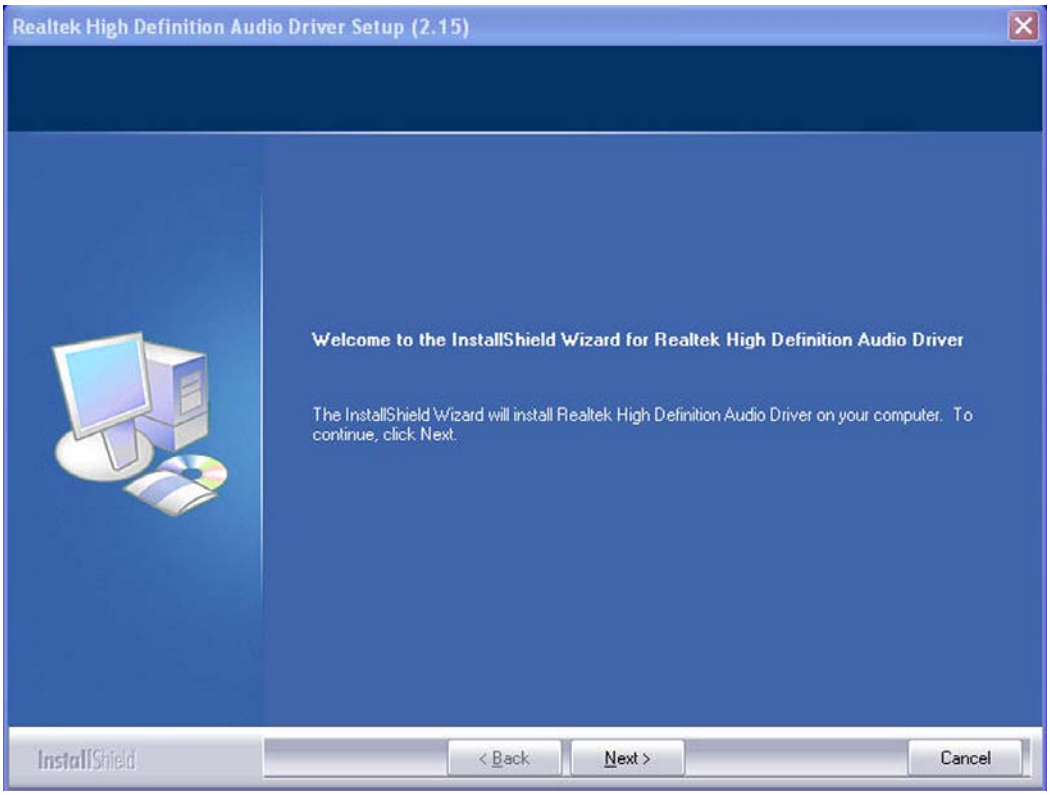

Realtek High Definition Audio Driver Setup (2.15)
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver
The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

Figure 7-24: HD Audio Driver Setup Welcome Screen

Step 6: The driver is automatically installed.

Step 7: After the driver installation process is complete, a confirmation screen shown in **Figure 7-25** appears.

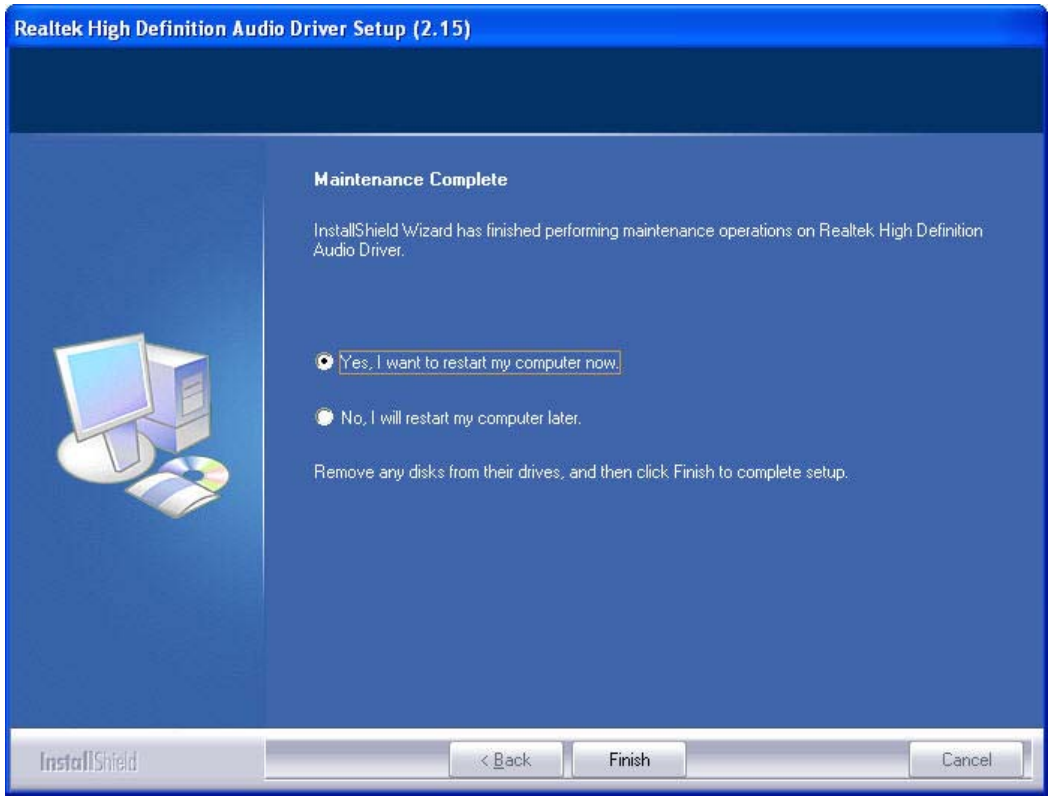

Realtek High Definition Audio Driver Setup (2.15)
Maintenance Complete
InstallShield Wizard has finished performing maintenance operations on Realtek High Definition Audio Driver.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

Figure 7-25: HD Audio Driver Installation Complete

Step 8: The confirmation screen shown in **Figure 7-25** allows you to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once you have decided when to restart the computer, click the "**FINISH**" button.

7.7 Realtek AC`97 Audio Driver (ALC665) Installation

To install the Realtek AC `97 audio driver, please follow the steps below.

7.7.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [AC`97]. See **Section 6.7.2** for details.

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.7.2 Driver Installation

Step 1: Insert the CD that came with the package.

Step 2: From the main driver menu, navigate to **X:\4-AUDIO\AC-KIT08R\Windows** (or other appropriate OS). **X:** represents the system CD drive. A new window appears showing the folder contents (**Figure 7-26**).

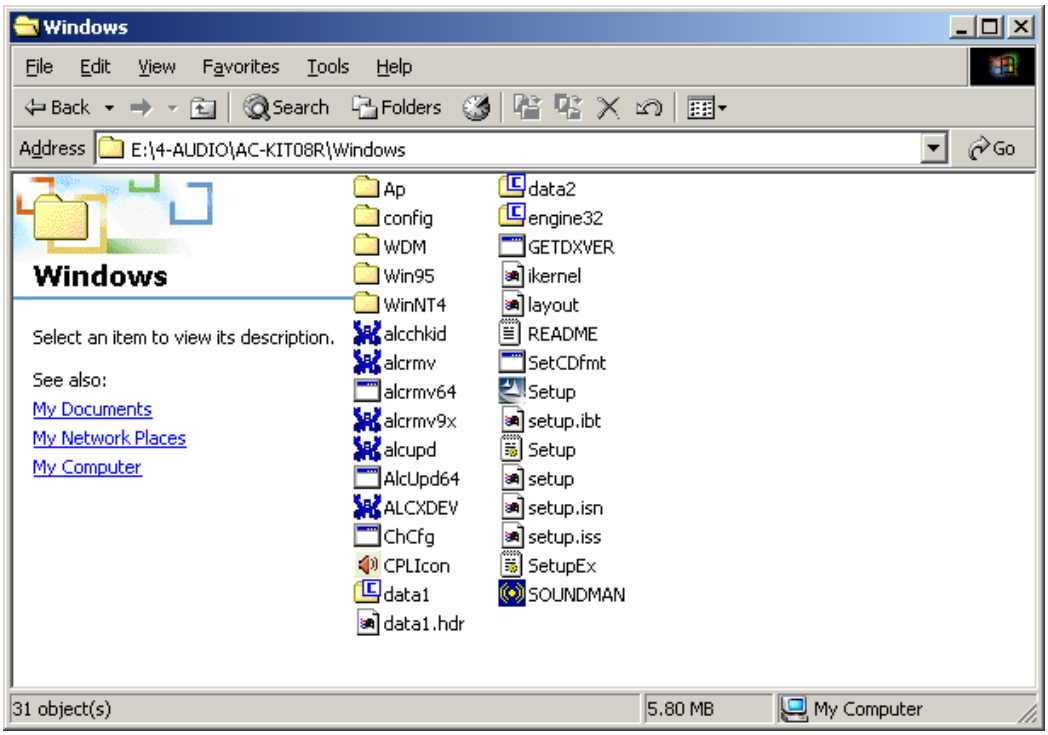


Figure 7-26: CD 4-AUDIO\AC-KIT08R\Windows Folder

Step 3: Double-click the **Setup.exe** file to begin the driver installation process.

Step 4: Once you double click the **Setup** icon, the install shield wizard for the audio driver starts. See **Figure 7-27.**

Figure 7-27: AC`97 Audio Driver Install Shield Wizard Starting

Step 5: The Realtek Audio Setup prepares the install shield to guide you through the rest of the setup process. See **Figure 7-24**.

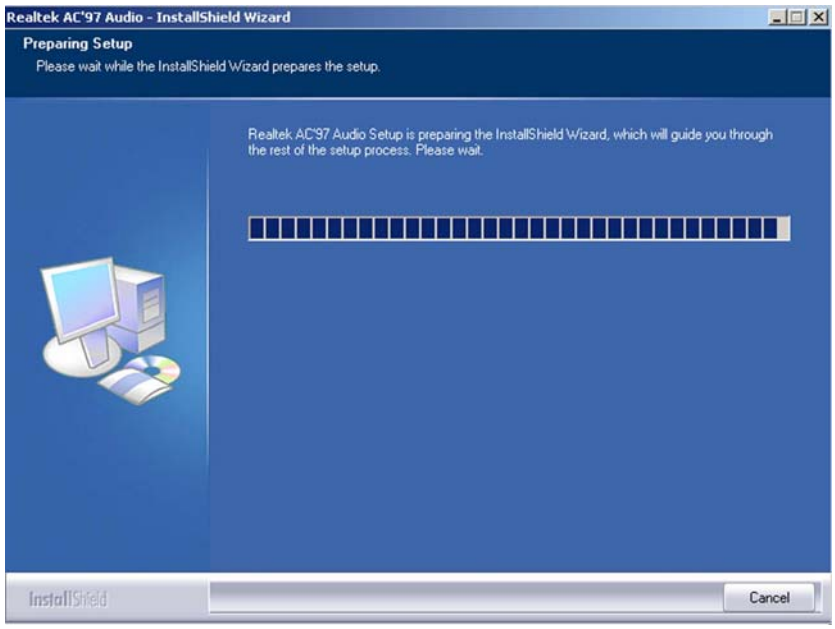

Realtek AC'97 Audio - InstallShield Wizard
Preparing Setup
Please wait while the InstallShield Wizard prepares the setup.
Realtek AC'97 Audio Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

Figure 7-28: AC`97 Audio Driver Setup Preparation

Step 6: After the install shield is prepared, the welcome screen shown in **Figure 7-29** appears. To continue the installation process, click the "**NEXT**" button. The install shield starts to configure the new software as shown in **Figure 7-30**.

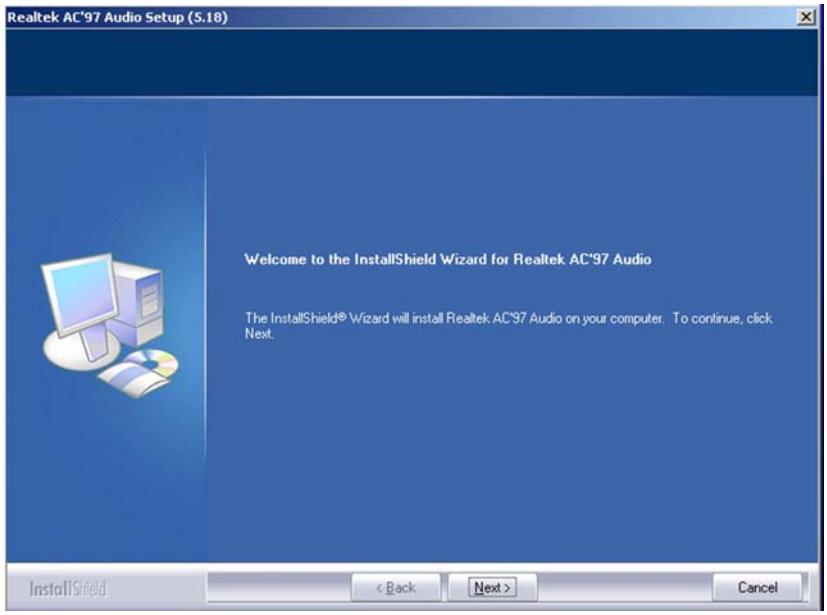

Realtek AC'97 Audio Setup (5.18)
Welcome to the InstallShield Wizard for Realtek AC'97 Audio
The InstallShield® Wizard will install Realtek AC'97 Audio on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

Figure 7-29: AC`97 Audio Driver Welcome Screen

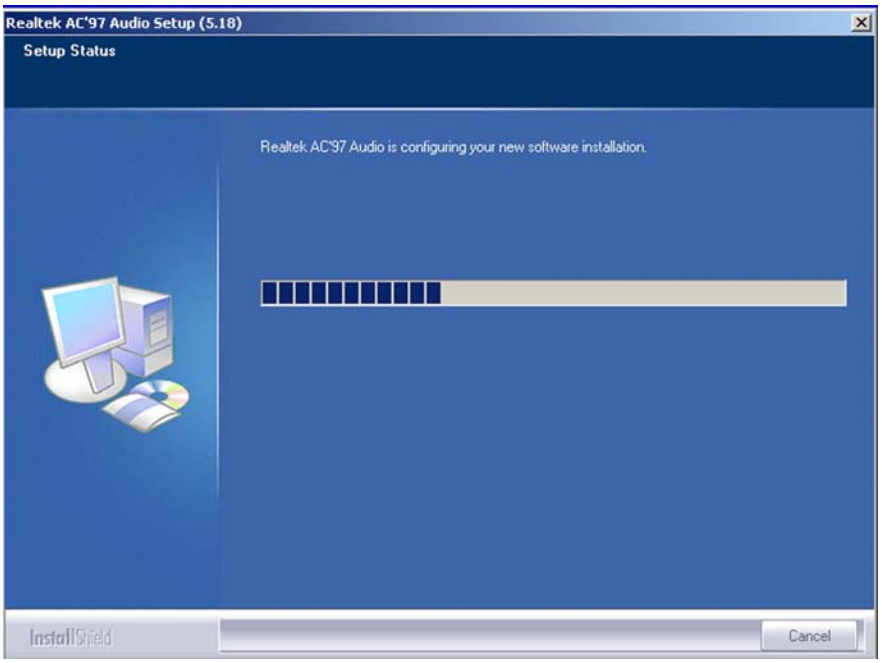


Figure 7-30: AC`97 Audio Driver Software Configuration

Step 7: At this stage the "**Digital Signal Not Found**" screen appears (**Figure 7-31**). To continue the installation process, click the "**YES**" button.

Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
Realtek AC'97 Audio
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

Figure 7-31: AC`97 Audio Driver Digital Signal

Step 8: After clicking the "**YES**" button in **Figure 7-31**, the installation of the driver begins (**Figure 7-32**).

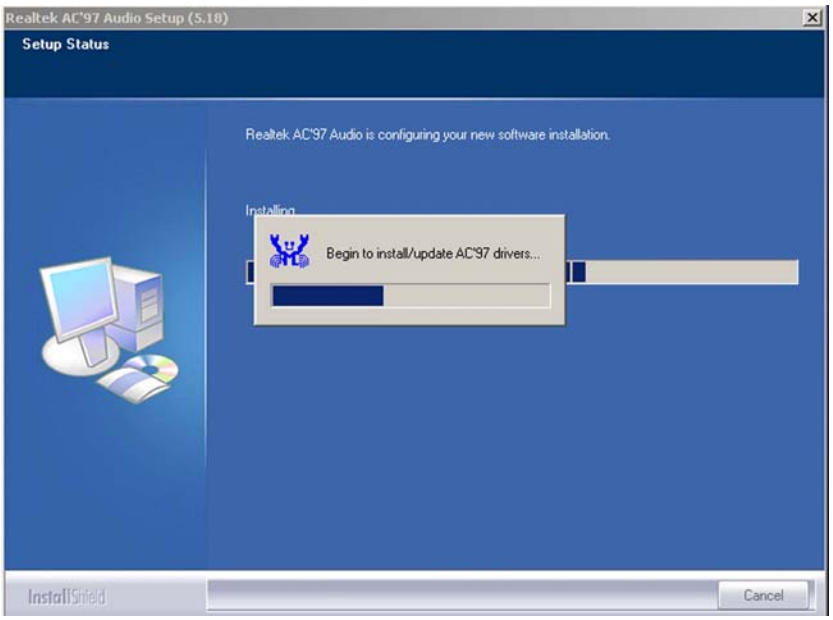


Figure 7-32: AC`97 Audio Driver Installation Begins

Step 9: After the driver installation process is complete, a confirmation screen shown in **Figure 7-33** appears.

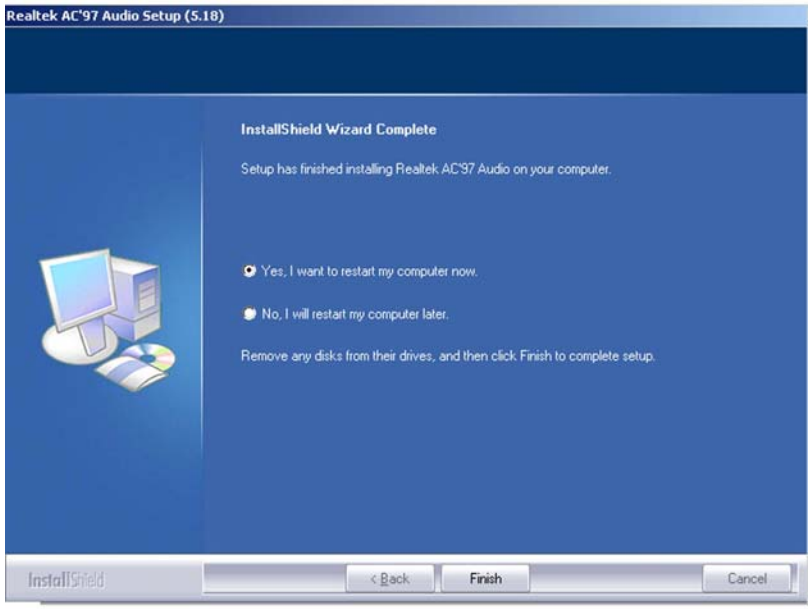

Realtek AC'97 Audio Setup (5.18)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

Figure 7-33: AC`97 Audio Driver Installation Complete

Step 10: The confirmation screen shown in **Figure 7-33** allows you to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once you have decided when to restart the computer, click the "**FINISH**" button.

7.8 Intel Matrix Storage Manager Installation

To install the Intel® Matrix Storage Manager driver, please follow the steps below:

Step 1: Select SATA from the list in **Figure 7-1**.

Step 2: A new window opens (**Figure 7-34**).

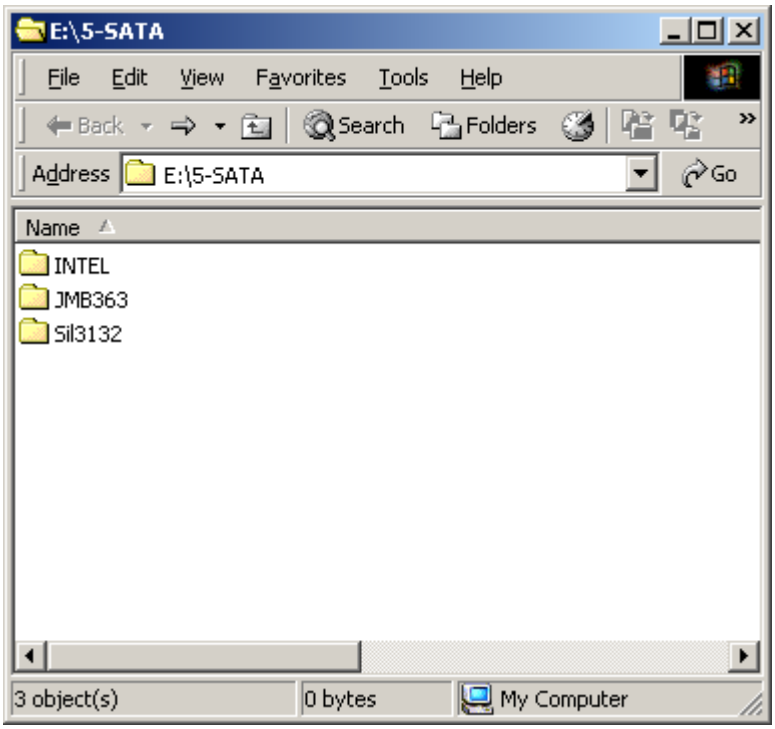


Figure 7-34: SATA RAID Driver Installation Program

Step 3: Double-click the **INTEL** folder.

Step 4: Double-click the **iata62_cd.exe** program icon in **Figure 7-35**.

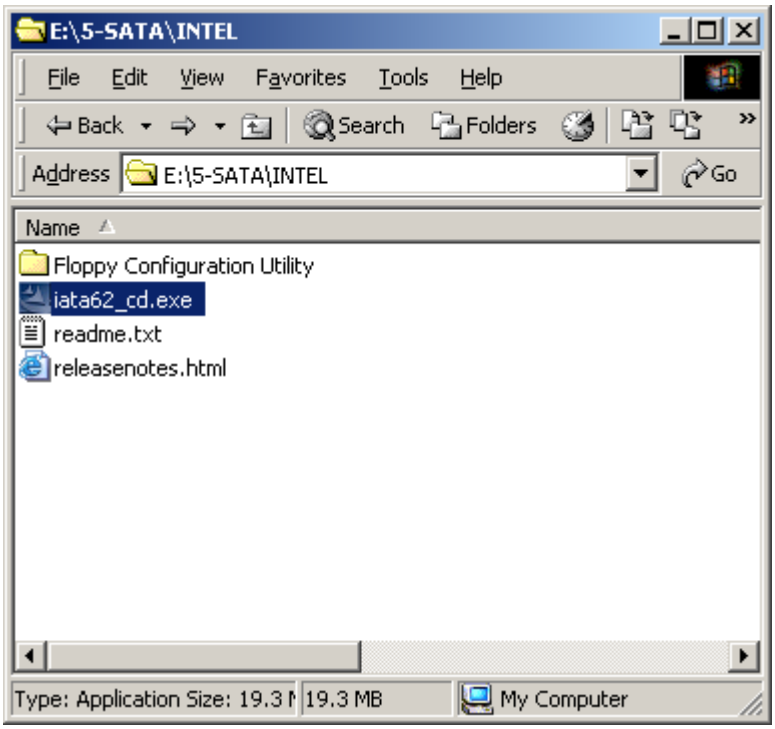


Figure 7-35: SATA RAID Setup Program Icon

Step 5: **Figure** 7-36 shows the **InstallShield Wizard** preparing to guide the user through the rest of the process.

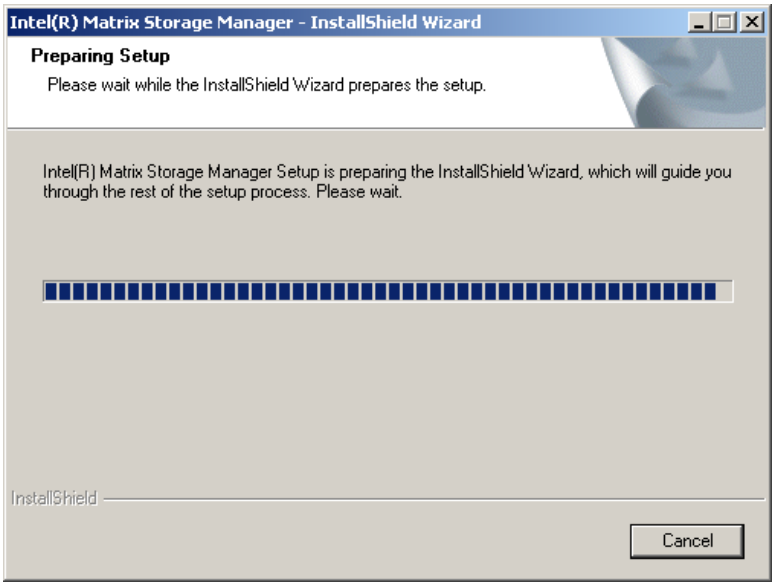

Intel(R) Matrix Storage Manager - InstallShield Wizard
Preparing Setup
Please wait while the InstallShield Wizard prepares the setup.
Intel(R) Matrix Storage Manager Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

Figure 7-36: InstallShield Wizard Setup Screen

Step 6: Figure 7-37 shows the Matrix Storage Manager software configuring the installation process.

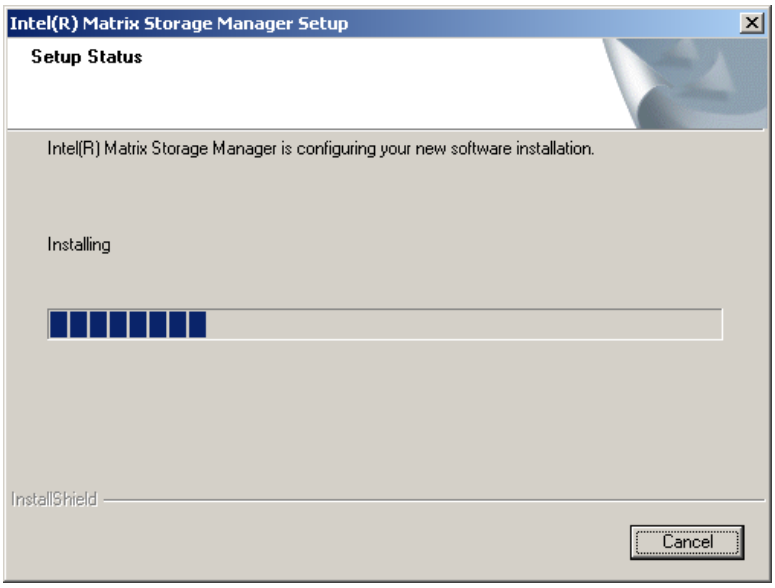


Figure 7-37: Matrix Storage Manager Setup Screen

Step 7: **Figure 7-38** shows the **Matrix Storage Manager** welcome screen.

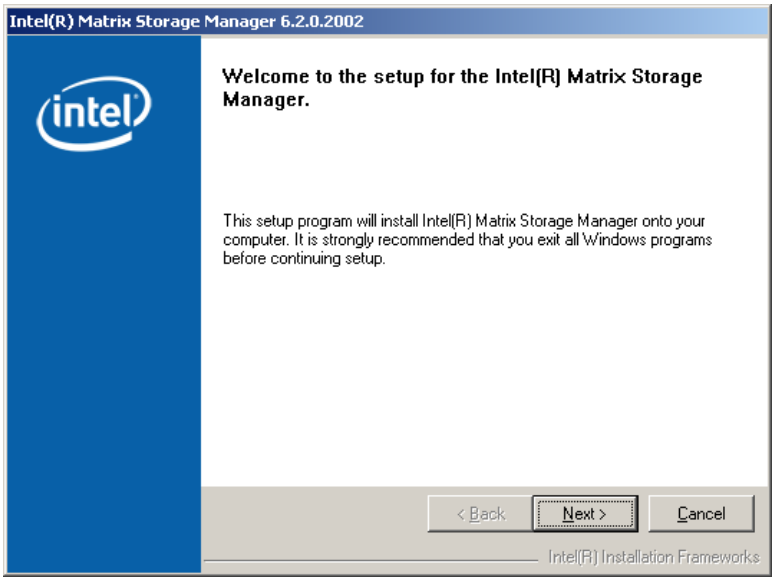

Intel(R) Matrix Storage Manager 6.2.0.2002
intel
Welcome to the setup for the Intel(R) Matrix Storage Manager.
This setup program will install Intel(R) Matrix Storage Manager onto your computer. It is strongly recommended that you exit all Windows programs before continuing setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-38: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-39**). Read the warning carefully and decide whether or not to continue the installation process.

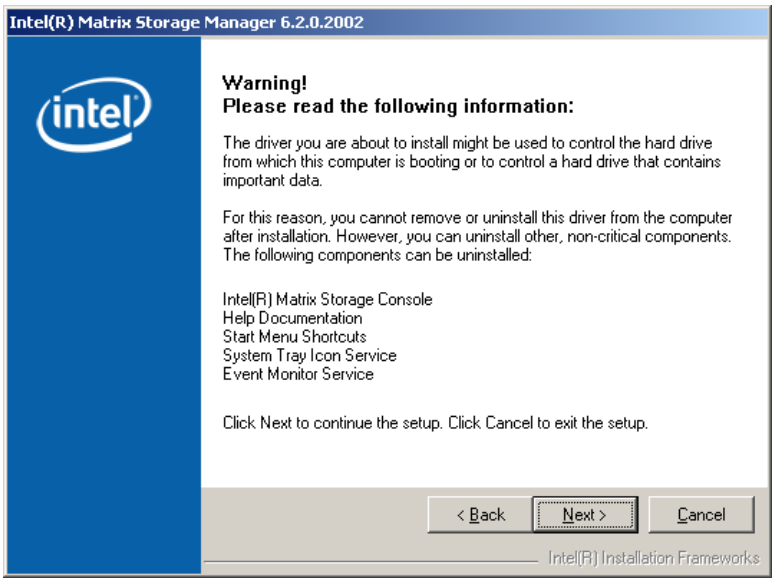

Intel(R) Matrix Storage Manager 6.2.0.2002
Warning!
Please read the following information:
The driver you are about to install might be used to control the hard drive from which this computer is booting or to control a hard drive that contains important data.
For this reason, you cannot remove or uninstall this driver from the computer after installation. However, you can uninstall other, non-critical components. The following components can be uninstalled:
Intel(R) Matrix Storage Console
Help Documentation
Start Menu Shortcuts
System Tray Icon Service
Event Monitor Service
Click Next to continue the setup. Click Cancel to exit the setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-39: Matrix Storage Manager Warning Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-40**).

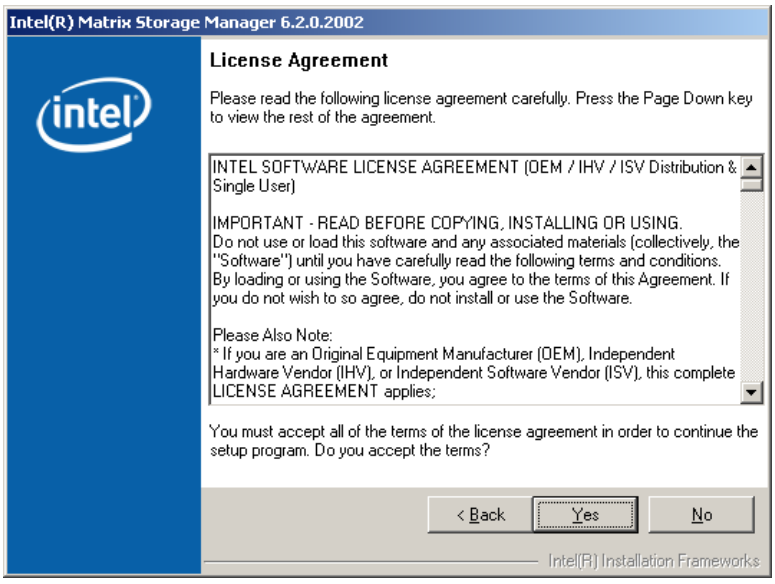

Intel(R) Matrix Storage Manager 6.2.0.2002
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-40: Matrix Storage Manager License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the Readme information file shown in **Figure 7-41** appears.

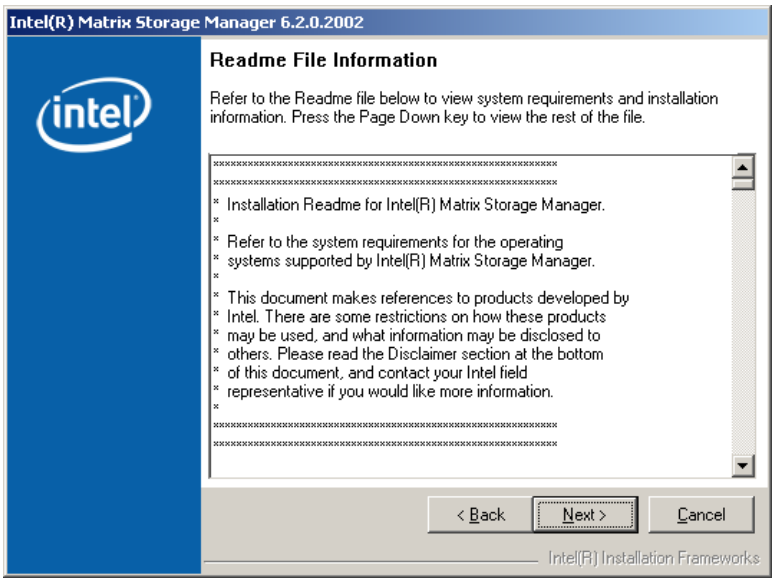

Intel(R) Matrix Storage Manager 6.2.0.2002
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Installation Readme for Intel(R) Matrix Storage Manager.
* Refer to the system requirements for the operating
* systems supported by Intel(R) Matrix Storage Manager.
* This document makes references to products developed by
* Intel. There are some restrictions on how these products
* may be used, and what information may be disclosed to
* others. Please read the Disclaimer section at the bottom
* of this document, and contact your Intel field
* representative if you would like more information.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-41: Matrix Storage Manager Readme File

Step 11: Read the Readme file information and click **NEXT**.

Step 12: After the driver installation process is complete, a confirmation screen appears (**Figure 7-42**).

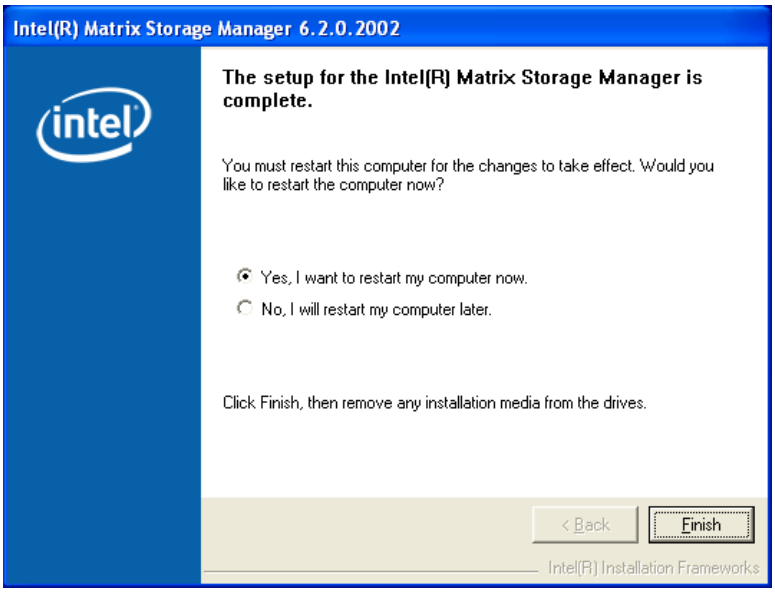

Intel(R) Matrix Storage Manager 6.2.0.2002
The setup for the Intel(R) Matrix Storage Manager is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Click Finish, then remove any installation media from the drives.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-42: Matrix Storage Manager Setup Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Appendix

A

BIOS Options

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Appendix

B

DIO Interface

B.1 DIO Interface Introduction

The DIO connector on the KINO-9453 is interfaced to GIO ports on the iTE Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the iTE Super I/O chipset.

B.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin No	Description	Super I/O Pin	Super I/O Pin Descripton
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 0	GP14	General purpose I/O port 1 bit 4.
4	Output 1	GP15	General purpose I/O port 1 bit 5.
5	Output 2	GP16	General purpose I/O port 1 bit 6.
6	Output 3	GP17	General purpose I/O port 1 bit 7.
7	Input 0	GP10	General purpose I/O port 1 bit 0.
8	Input 1	GP11	General purpose I/O port 1 bit 1
9	Input 2	GP12	General purpose I/O port 1 bit 2
10	Input 3	GP13	General purpose I/O port 1 bit 3

B.3 Assembly Language Samples

B.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	**AX, 6F08H**	Sets the digital port as input
INT	**15H**	Initiates the INT 15H BIOS call

B.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	**AX, 6F09H**	Sets the digital port as output
MOV	**BL, 09H**	
INT	**15H**	Initiates the INT 15H BIOS call

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

Appendix

D

Address Mapping

D.1 Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel Graphics Controller
3C0-3DF	Intel Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table D-1: IO Address Map

D.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table D-2: 1st MB Memory Address Map

D.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table D-3: IRQ Mapping Table

D.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table D-4: IRQ Mapping Table

Appendix

E

Intel® Matrix Storage Manager

E.1 Introduction

The Intel® ICH7R chipset can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.

CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

E.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

E.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

E.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 1: **Connect SATA drives to the system**. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: **Enable SATA drives in BIOS**. Start the computer and access the **BIOS** setup program. Enable **SATA** support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.

Step 3: **Save and Exit BIOS**. After the **SATA** support option is enabled, save and exit the **BIOS**.

Step 4: **Reboot the system**. Reboot the system after saving and exiting the **BIOS**.

Step 5: **Press Ctrl+I**. During the system boot process, press **Ctrl+I** when prompted to enter the RAID configuration software.

Step 6: **Configure the RAID settings**. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

Step 7: **Install the OS**. After the RAID array has been configured, install the OS. To do this, please refer to the documentation that came with the OS.

E.4 RAID Configuration

E.4.1 Creating a RAID Volume

WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** "**Create RAID Volume**." Use the arrow keys to highlight **Create RAID Volume** and press **ENTER**. See Figure E-1.

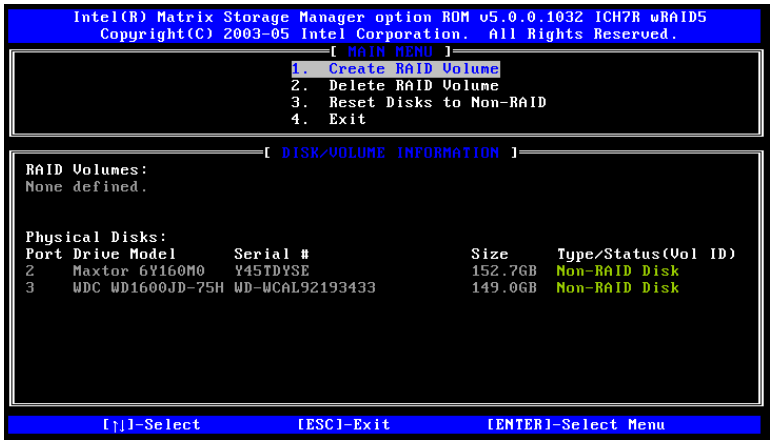
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-1: Matrix Storage Manager Main Menu

Step 2: **Name the RAID volume**. Enter a name for the RAID volume, or press **ENTER** to accept the default volume name. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array. See Figure E-2.

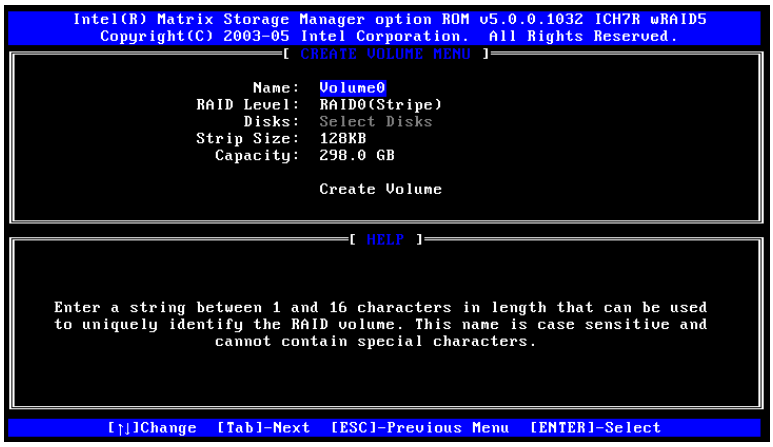
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and cannot contain special characters.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure E-2: Create RAID Volume Name

Step 3: **Choose the RAID level**. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10. See Figure E-3.

NOTE:

RAID 0 and RAID1 levels require a minimum of two hard drives.

RAID 10 level requires a minimum of four hard drives.

RAID5 level requires a minimum of three hard drives.

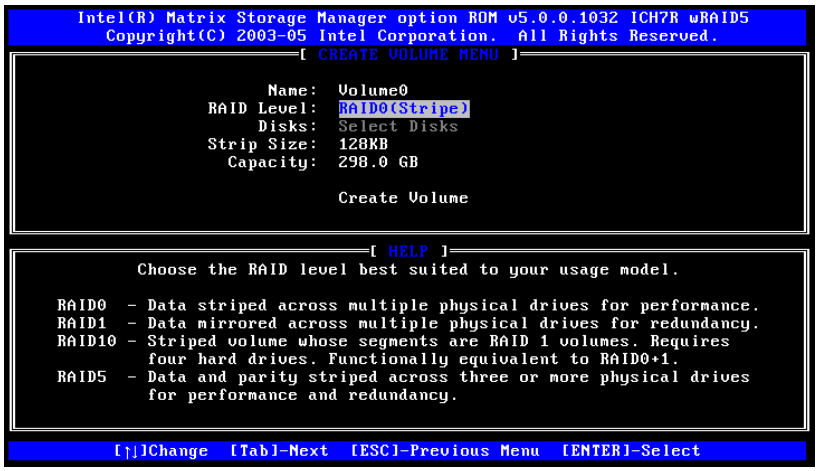
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Choose the RAID level best suited to your usage model.
RAID0 - Data striped across multiple physical drives for performance.
RAID1 - Data mirrored across multiple physical drives for redundancy.
RAID10 - Striped volume whose segments are RAID 1 volumes. Requires four hard drives. Functionally equivalent to RAID0+1.
RAID5 - Data and parity striped across three or more physical drives for performance and redundancy.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure E-3: Choose the Raid Level

Step 4: **Select the Stripe Size**. Select a stripe size from the list. See Figure E-4.

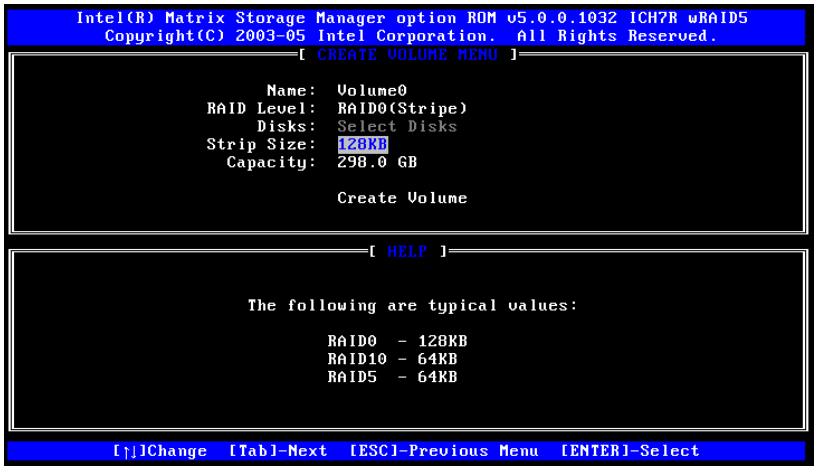

Figure E-4: Select the Stripe Size

Step 5: **Enter the Volume Capacity**. Enter the volume capacity, or press **ENTER** to accept the default capacity. See Figure E-5.

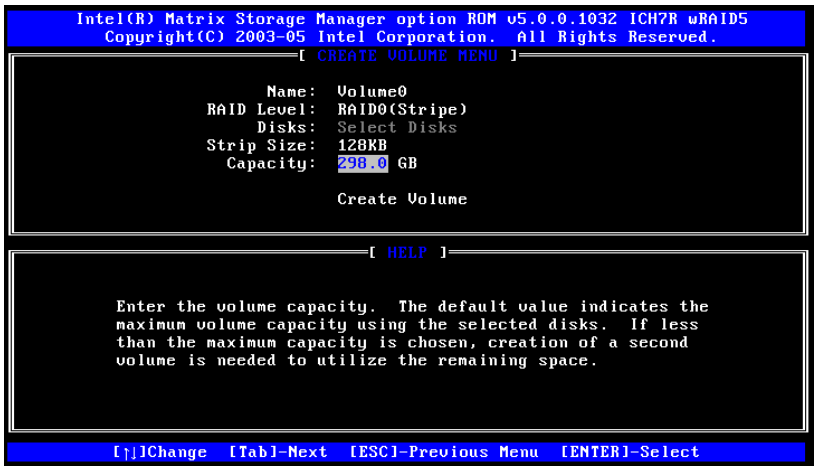
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Enter the volume capacity. The default value indicates the maximum volume capacity using the selected disks. If less than the maximum capacity is chosen, creation of a second volume is needed to utilize the remaining space.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure E-5: Enter the Volume Capacity

Step 6: **Create the RAID Volume**. Press **ENTER** to create the RAID volume as specified. See Figure E-6.

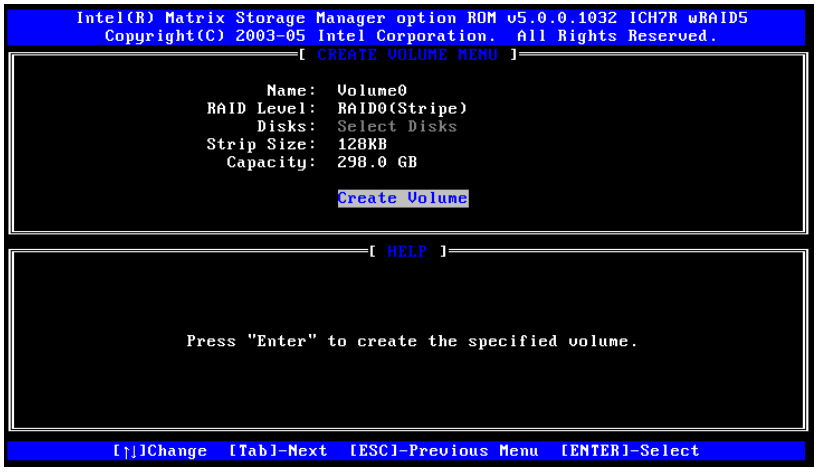
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Press "Enter" to create the specified volume.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure E-6: Create the RAID Volume

Step 7: **Create RAID Volume Verification**. After reading the warning, press **Y** to create the RAID volume as specified, or **N** to return to the **Create RAID Volume** menu. See Figure E-7.

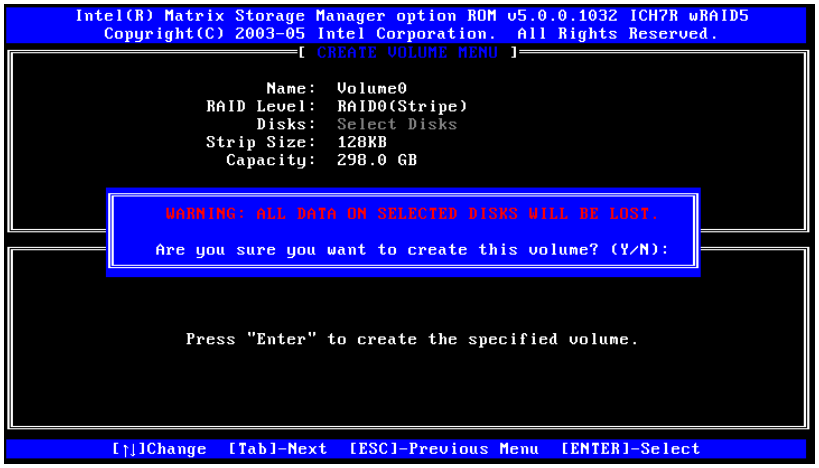
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N):
Press "Enter" to create the specified volume.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure E-7: Create RAID Volume Verification

E.4.2 Deleting a RAID Volume

WARNING!

All data stored on the member drives of a RAID volume are destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

Step 1: **Select** "**Delete RAID Volume**." Use the arrow keys to highlight **Delete RAID Volume** and press **ENTER**. See Figure E-8.

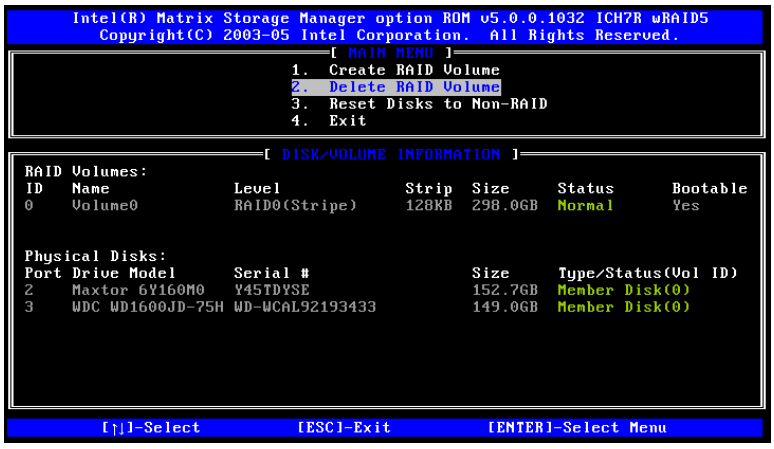
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-8: Delete RAID Volume Menu

Step 2: **Select RAID Volume to be Deleted**. Use the arrow keys to highlight the RAID volume to be deleted and press **ENTER**. See Figure E-9.

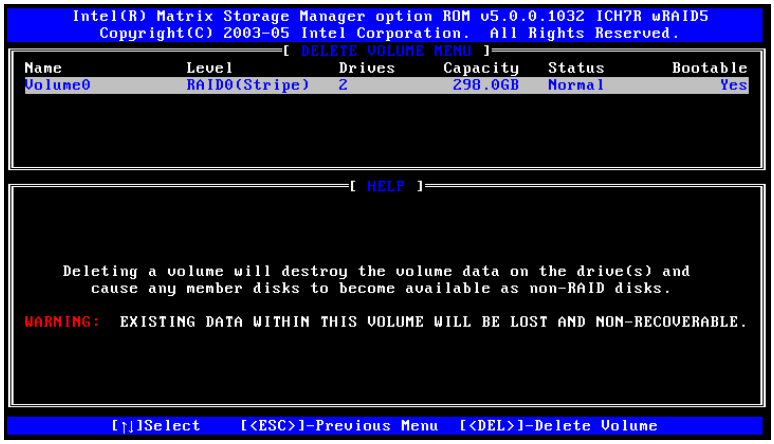
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[HELP]
Deleting a volume will destroy the volume data on the drive(s) and cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.
[↑↓]Select [<ESC>]-Previous Menu [<DEL>]-Delete Volume

Figure E-9: Select RAID Volume to be Deleted

Step 3: **Delete Volume Verification**. After reading the warning, press **Y** to delete the specified RAID volume, or **N** to return to the **Delete Volume** menu.

See Figure E-10.

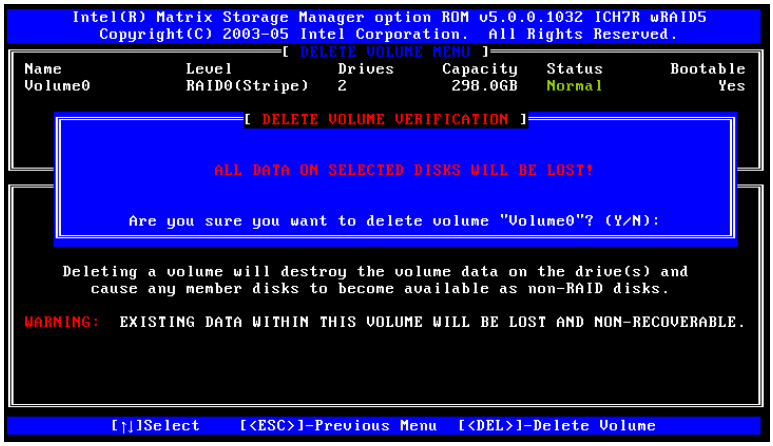
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[DELETE VOLUME VERIFICATION]
ALL DATA ON SELECTED DISKS WILL BE LOST!
Are you sure you want to delete volume "Volume0"? (Y/N):
Deleting a volume will destroy the volume data on the drive(s) and cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.
[↑↓]Select [<ESC>]-Previous Menu [<DEL>]-Delete Volume

Figure E-10: Delete Volume Verification

Step 4: **Non-RAID Disks**. After deleting the RAID volume, the disks belonging to the volume will be shown as non-RAID disks. See Figure E-11.

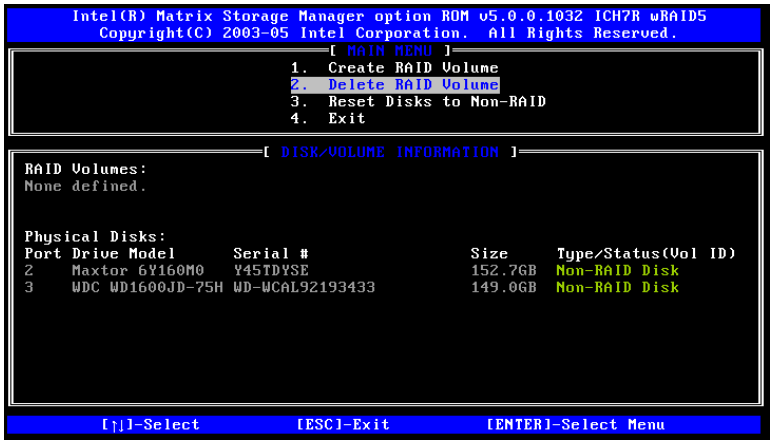
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-11: Non-RAID Disks

E.4.3 Resetting a Disk to Non-RAID

WARNING!

All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.

Step 1: **Select** "**Reset Disk to Non-RAID**." Use the arrow keys to highlight **Reset Disk to Non-RAID** and press **ENTER**. See Figure E-12.

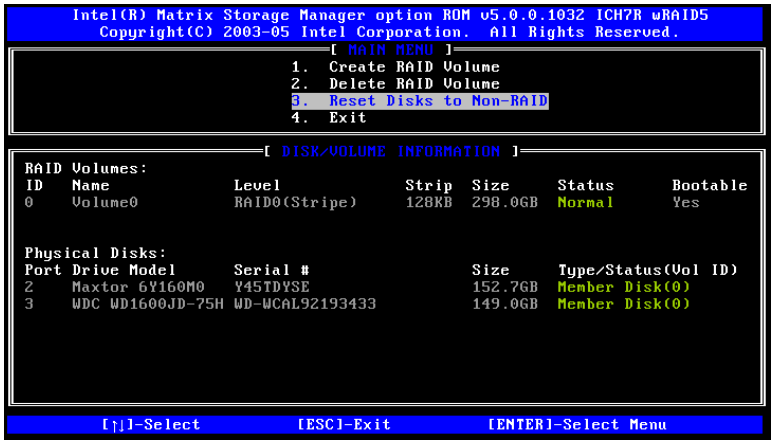
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-12: Reset Disk to Non-RAID Menu

Step 2: **Select Disks to Reset**. Use the arrow keys to scroll through the disk drives and press **SPACE** to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press **ENTER**. See Figure E-13.

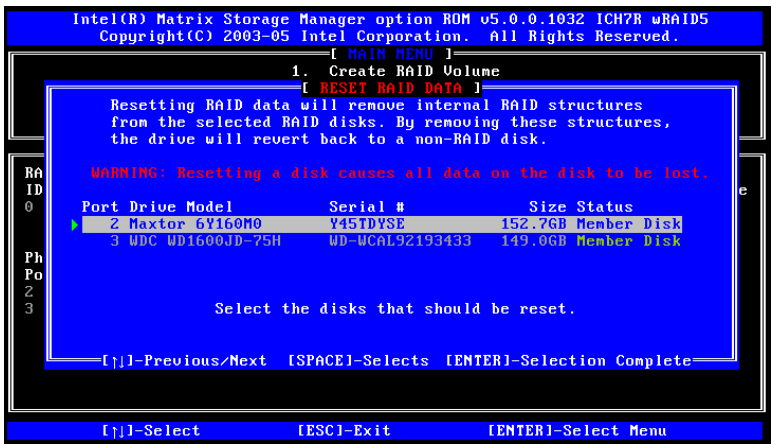
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
Port Drive Model Serial # Size Status
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk
Select the disks that should be reset.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-13: Select Disk to Reset

Step 3: **Reset Disk Verification**. After reading the warning, press **Y** to reset the selected disks as non-RAID, or **N** to return to the **Reset RAID Data** menu. See Figure E-14.

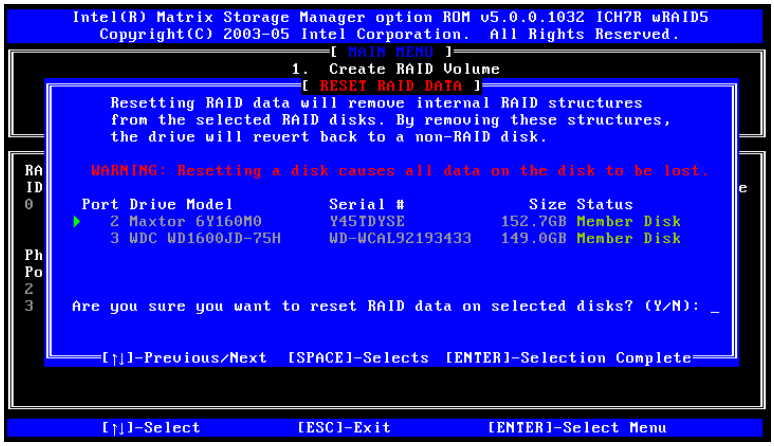
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
Port Drive Model Serial # Size Status
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk
Are you sure you want to reset RAID data on selected disks? (Y/N): _
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-14: Reset Disk Verification

Step 4: **Disk Drive and RAID Volume Status**. After the disk drives have been reset, the **Matrix Storage Manager Main** menu is shown indicating the status of the RAID volumes and disk drives. See Figure E-15.

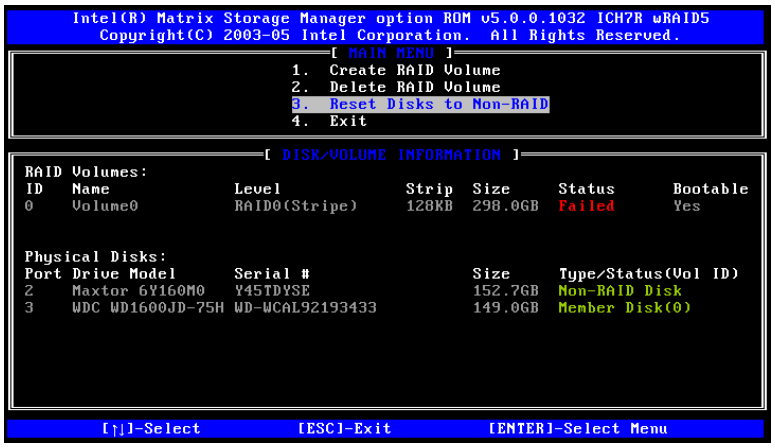
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Failed Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-15: Disk Drive and RAID Volume Status

E.4.4 Exiting the Matrix Storage Manager

Step 1: **Select** "**Exit**." Use the arrow keys to highlight **Exit** and press **ENTER**.

See Figure E-16.

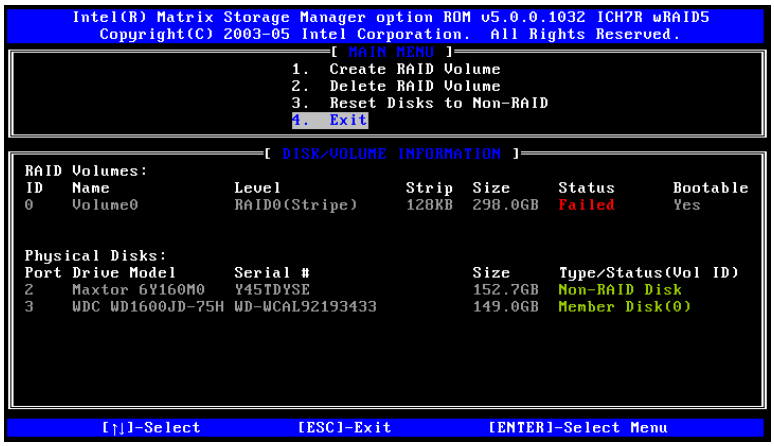
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Failed Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-16: Exit Menu

Step 2: **Exit Verification**. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to the **Main** menu. See Figure E-17.

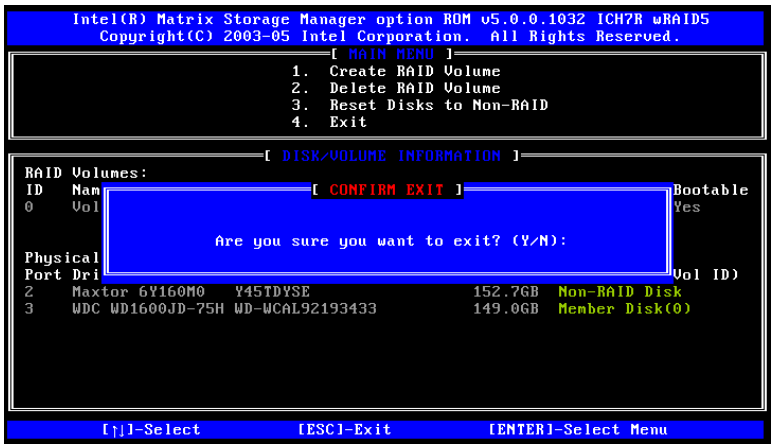
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
[CONFIRM EXIT]
Are you sure you want to exit? (Y/N):
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure E-17: Exit Verification

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